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(Original Official Organ U. S. Vet. Med. Ass'n).

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READJUSTMENT

MORE than a year has passed since the great cyclone raged in Europe, but the winds still blow fitfully. At this writing our country, technically, is not yet on a peace basis. It was slow in declaring that a state of war existed and seems to be equally slow in declaring peace. In the meantime conditions are favorable for unrest and agitation at home, misunderstanding and nervous tension with our former allies, and a certain amount of hopefulness on the part of our late enemies that American statesmen (?) will soften or nullify the work accomplished by the Allied and American armies.

Civilization was placed in jeopardy by the war. It was saved only by the blood and lives of millions of gallant men. Yet there are some proclaiming 100 per cent Americanism who, by their action, after the pus has been drained from the European abscess, prevent disinfection, thereby delaying the healing process, and remain indifferent to the realization that the remnants of pus may in time develop another abscess which may again involve this country in a disagreeable surgical operation.

In union there is strength. If brotherhood and *entente cordiale*

were desirable for the sake of humanity during the war, why should they not continue in time of peace? Whether we wished it or not, our country has become a world power, and it should not evade its responsibilities. Isolation contracts the soul and makes the world unsafe for democracy. We have become a creditor nation in a world upset by abnormal conditions. We have obligations to our neighbors with whom we must continue commercial, political and social relations. These obligations are pressing and insistent. Our neighbors stagger under an overload of debt. Our late enemy must pay, but all he can possibly pay will meet only a fraction of the loss. He has not lost his fields, mines nor factories, but he has lost caste and overseas trade and faces a world which regards him with suspicion or hatred. He has a terrible reputation to live down. What he can earn must go to pay the fiddler to whose deadly music he chose to dance.

We have fought an enemy in the open, but we are still fighting a secret enemy. There are secret serpents sneaking through our land, who endeavor by insidious and seditious propaganda to weaken and destroy our present form of government. Boring from within, they seek to undermine our various lines of industry, paralyze our transportation, kill our traffic, in order that our allied neighbors depending upon us for support may be still further crippled, while our late enemy may become rehabilitated. Under whatever guise their motives may be proclaimed, when carried into effect the result is to aid and comfort the foe and still further cripple the defenders of civilization. Complete victory will not be won until the secret enemies are disposed of. If the American people do not own this country, who does? This nation has been the melting pot for the burdened and the oppressed. Freedom and opportunity have been offered them, but some will not melt. Like vipers they would sting the hand that nourishes them. Let such incompatibles as will not fuse with us be cast aside. If they can not construct our future destiny with us, they must not be permitted to destroy what we have.

Many of the problems of readjustment have been met and settled with surprising rapidity. The demobilization of 4,000,000 American soldiers and their induction into peaceful occupations has been accomplished without undue excitement. The problems are obviously much greater in the zone where the cyclone raged than in more distant zones; but no matter how great the distance, certain problems persist and become intensified when apostles of lawlessness, taking advantage of the unsettled conditions, preach and practice the doc-

trine of hate and of crime. Increased production so essential for our own welfare and prosperity, as well as that of our neighbors, has been retarded or decreased by those who knowingly or unknowingly have played into the hand of the enemy.

The New Year dawns with more peace in Europe than has existed during the past five years. Good will, forgiveness and trust will be of slower development. The forces of destruction have been rapid and efficient; those of construction will be difficult and prolonged. The nightmare has passed, but it has left us shaken and perturbed in arousing to the activities of the day.

The veterinarian as a public-spirited citizen has his share in the general problems of readjustment—he is a citizen before he is a professional man. Veterinarians who have been in the military service have also individual readjustments to make. For two years they have lived in a different atmosphere amid conditions previously undreamed of. In some instances their experiences have unsettled them for the routine work to which they devoted themselves in the pre-war period. In some cases there have been instances of apparent injustice and partiality. Some have returned to better opportunities. Some have returned to find their former practice demoralized or invaded by others. Tremendous difficulties have attended the veterinary service from the beginning to the end of the war, but in spite of insuperable obstacles the veterinarians have made good, and one important factor that has sustained them in their almost superhuman efforts is the realization that the profession stood behind them. They are big enough and have vision enough to submerge personal grievances in the greater results achieved by their united action.

P. A. F.

DEAN AND DIRECTOR DALRYMPLE

THE country of Robert Bruce and "Bobbie" Burns has contributed liberally to the growth and elevation of the veterinary profession in America. Many of our most successful practitioners came from Scotland, and her colleges have prepared some of our most distinguished educators and research workers. Dr. Dalrymple is one of the most prominent Scotchmen of our profession who came to the United States to make a home among us and to be one of us. His many friends throughout the country will be pleased to learn that he has been selected to succeed Dr. W. R. Dodson, whose resignation as dean of the Louisiana State College of Agriculture and director of the Louisiana Experiment Station became effective January 1.

Dr. Dalrymple was born at Stranraer, Wigtownshire, Scotland, April 23, 1856, graduated from the Glasgow Veterinary College with the degree of M. R. C. V. S. in 1886, and sailed for America three years later. Shortly after his arrival in the United States he became identified with the Louisiana State University, where he has remained continuously ever since except for an interval of three years in the nineties which was devoted to study and travel in Europe and South Africa.

Dr. Dalrymple enjoys a high reputation as a scientist, he has been eminently successful as an educator, and is regarded not only in Louisiana but throughout the country as one of the ablest exponents of scientific agriculture and live-stock production. The high esteem in which he is held is evidenced by the honors that have been accorded him by the various medical, live-stock and agricultural bodies with which he has been identified. He served as president of the American Veterinary Medical Association 1907-8, president of the United States Live Stock Sanitary Association 1908-9, member of the Executive Committee of the National Live Stock Association 1902-4, and president of the United States Experiment Station Veterinary Medical Association 1901-2. He was chosen as reporter on anthrax for the United States at the International Veterinary Congress held in London in 1914, member of the International Congress on Tuberculosis at Washington in 1908, and member of the International Congress on Hygiene and Demography at Washington in 1912, and is a Fellow of the Glasgow Veterinary Medical Society.

Dr. Dalrymple has always taken an active interest in State and local matters in Louisiana and has done much to advance agriculture and promote the live-stock industry of the State. He has served his State as secretary of the Louisiana State Agricultural Society and Louisiana Stock Breeders' Association, as president of the Louisiana Veterinary Medical Association and the Louisiana Society of Naturalists, as member of the Louisiana State Live Stock Sanitary Board, and as editor of the live-stock department of the New Orleans *Picayune*. His excellent services as editor of our JOURNAL during the past year are too well known to require further comment. He is the author of a valuable work on veterinary obstetrics and in addition has written various bulletins and contributed to publications many articles relating to agriculture and live-stock matters. His new assignment broadens the scope for continuing his useful activities, and the JOURNAL joins his many friends in wishing him success in his new field.

INTERNATIONAL VETERINARY CONGRESS

AT the recent meeting of the American Veterinary Medical Association at New Orleans a motion was unanimously adopted to invite the next International Veterinary Congress to convene in this country. With the view of initiating a movement to expedite this proposal a committee was appointed by ex-President Moore, and steps have already been taken by Secretary Eichhorn to inquire of Dr. DeJong, the General Secretary of the Permanent Committee at Leyden, Holland, what procedure the A. V. M. A. committee should pursue to bring this matter before the Permanent Committee of the Eleventh International Veterinary Congress. Many members of the A. V. M. A. believe that arrangements could be made to have the Congress meet in the United State in 1921, but should the time for preparing for the Congress be insufficient, we could consider a Congress for the year 1922.

Our Association with its membership of approximately 4,500 would be happy to have the opportunity of entertaining the International Congress in this country. Moreover, aside from the members of our Association, everyone interested in the veterinary profession and in the live-stock industry of this country would heartily support such a movement. While our committee has not as yet approached the Federal Government as to the support we could expect to receive, we are satisfied that the proper authorities will render all the assistance necessary toward the success of such an undertaking when the time is ripe. As soon as Dr. DeJong furnishes information as to the proper procedure for extending an official invitation, appropriate steps will be taken, as it is fully realized that considerable time will be required for the preparation of such an elaborate undertaking.

The members of the committee are Drs. L. A. Merillat, L. Van Es, D. S. White, F. Torrance, C. A. Cary, A. Eichhorn, secretary, and J. R. Mohler, chairman.

NATIONAL RESEARCH COUNCIL

DURING the war the National Research Council, acting as a department of the Council of National Defense, was able to render substantial service to the Government. Established under the Congressional charter of the National Academy of Sciences and organized with the cooperation of the largest national scientific and technical societies of the country, the Council has now passed over

to a peace-time basis. A review of the personnel of the Council will indicate the wide scope of its scientific and technical support and the distinguished scientific character of its divisional chairmen who are resident in Washington.

The Council was organized in 1916 at the request of the President as a measure of national preparedness, and the results obtained were nothing short of marvelous in stimulating research in the mathematical, physical and biological sciences and in the application of these sciences to medicine, agriculture and the useful arts. During the war it was science that enabled America and the Allies to overcome the formidable war effort of Germany, and it will be to science that the world will turn for aid in meeting after-war problems.

The Government Relations Division of the National Research Council met at the Smithsonian Institution on December 19, 1919, Dr. Charles D. Walcott, Director of the Smithsonian Institution, presiding. One of the principal topics discussed was food of both vegetable and animal origin, the latter subject being of special interest to all veterinarians. Our profession was represented by the Chief of the Bureau of Animal Industry, who was appointed a member of the Council by President Wilson on recommendation of the Secretary of Agriculture.

PUBLICATION OF THE PROCEEDINGS

THE proceedings of the first day's sessions of the Fifty-sixth Annual Meeting of the American Veterinary Medical Association at New Orleans appear in this number. It has been the practice heretofore to publish the proceedings in a special extra edition of THE JOURNAL, but that plan can no longer be followed because the Post Office Department holds that such extra numbers are not permissible under the second-class mailing privilege. We have therefore concluded to print the proceedings in instalments in the regular issues of THE JOURNAL. The remaining portions will follow from month to month and the whole will be completed just as soon as available space will permit.

Dr. John W. Scott, Parasitologist of the Wyoming Agricultural Experiment Station, Laramie, Wyoming, is spending the current collegiate year at the laboratories of the Zoological Division, Bureau of Animal Industry, Washington, D. C., in investigations relating to animal parasites.

NOTES ON SWAMP FEVER[1]

By S. HADWEN

Chief Pathologist, Health of Animals Branch, Canadian Department of Agriculture, Ottawa, Canada

FOR some time past cooperative investigations on swamp fever in horses have been carried on by the United States and Canadian Departments of Agriculture, and during the course of these investigations Dr. B. H. Ransom and I have made trips into swamp-fever districts in Canada and are also carrying on some experiments at Washington and at Ottawa. It is my purpose at the present time, with the approval of Dr. Ransom, merely to call attention to a few points that have come out in the course of our work.

One of the questions which has perplexed men working on swamp fever has been the presence of worms in the cases, and it has evidently been difficult for them to decide except by blood inoculation whether they were dealing with a swamp-fever case or a verminous one. This has been our experience also. The symptoms presented by a case of gross parasitism apparently resemble closely those of a case of swamp fever.

In 1918 we published a paper on our Canadian worms, giving the locations in which the parasites were found but saying very little about the lesions encountered. Attention was, however, called to the ulcers found in the colon which were associated with, and were evidently caused by, a certain species of nematode, *Triodontophorus tenuicollis*. These ulcers had been previously noticed by Weinberg in France and later by Hartman in Montana. These authors did not identify the particular nematode causing the lesions. At least two other species of *Triodontophorus* are of common occurrence in the colon of horses in America, but so far as we have been able to determine they do not produce ulcers. The ulcers, except for the presence of worms, are very similar in gross appearance to those found in hog cholera, though in some cases are larger and in one or two instances those observed had been close to perforating the bowel, the resulting scar being puckered in appearance.

In addition to these ulcers, worms produce certain other striking lesions which may be mistaken for swamp-fever lesions. In the abdominal cavity many of these lesions are encountered. For in-

[1] Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

stance, when the kidneys are removed it will frequently be observed that the adjacent lymphatic glands are hemorrhagic and that the tissues surrounding them are gelatinous. In such tissues we repeatedly found the immature forms of *Strongylus*, which in one case were determined by microscopic examination to be *S. equinus*. In the gastro-hepatic ligament also young worms of this species were encountered, as many as 12 having been found in a single case. On the walls of the abdominal cavity reddened patches resembling bruises may be noticed under the peritoneum. In these patches young *S. edentatus* will be found.

In the descriptions of postmortems on swamp-fever cases given in the literature, intestinal lesions both external and internal are frequently mentioned. In our postmortems nodules and reddened edematous patches, visible on observation of the serous surface, were frequent, as well as petechiæ. The petechiæ are not necessarily caused by worms, but in the nodules and reddened patches worms are usually discoverable. When the large intestine is opened numerous lesions are revealed that are directly attributable to worms. These are due, first, to the young worms that pass a portion of their life history in the intestinal walls, and, second, to the adults of certain species in the lumen of the intestine that attack the mucosa. The larval forms of the Cylicostomes are found embedded in the mucosa throughout the colon and cecum, being most numerous in the cecum and first and second divisions of the colon, sometimes as many as 50 per square inch. Submucous nodules of varying size up to nearly an inch in diameter are irregularly scattered throughout the course of the large intestine. These contain a yellowish or bloody serum and a larval worm. As the nodules become older the contents become less fluid and take on a yellow cheesy consistency, finally becoming calcareous. In such nodules dead and degenerated parasites may be found. Commonly the undegenerated nodules have a definite circular opening into the lumen of the intestine through which the contents including the larva may be squeezed by applying pressure.

In addition to the ulcers caused by *Triodontophorus tenuicollis*, which occur in the fourth division of the colon near the mesenteric attachment, the bites of the three species of *Strongylus* are very noticeable. The principal places in which these bites occur are in the cecum at the blind end, where *S. vulgaris* is most numerous; in the cecum and first division of the colon in the neighborhood of their juncture are other bites caused by *S. edentatus* and *S. equinus*,

and in the first division of the colon bites caused by *S. edentatus*. The bites correspond in shape and size to the buccal cavity of the worms, those of *S. edentatus* being the largest and those of *S. vulgaris* the smallest. They are small, round, red spots raised above the surface of the surrounding mucosa and comprising the portion of the mucosa that was sucked into the buccal cavity of the parasite.

To sum up the lesions observed in many of the postmortems so far as concerns the interior of the large intestine, there is a general spotting of the mucosa, the very small dark spots being larvæ in the mucosa, somewhat larger bright red spots being the bites of strongyles, and larger irregular blotches which may be caused by the parasites; however, as similar blotches may occur in the small intestines in the same animal without evident association with parasites in that region of the bowel, it is not at all certain that these are directly due to parasites. The spotting of the intestinal wall together with the nodules, edematous patches and ulcers are the main lesions of the intestine caused by worms. Finally may be mentioned the exudate, a grayish, sticky, evil-smelling mucus covering the mucosa of the large intestine of animals in a moribund condition, and dried feces often adherent to the mucosa of the third division of the colon. This condition has been noted especially in those cases in which there was a high degree of infestation with worms. Commonly the worms in this exudate were very sluggish or dead.

In connection with heart lesions in swamp fever the hemorrhagic spotting of the endocardium frequently described as a typical lesion of the disease has been a very constant lesion in the cases we observed in the field. It is an interesting fact that in a number of apparently healthy horses experimentally injected subcutaneously with fresh juices of worms or extracts of dried worms or bots the heart was found on postmortem to show lesions very similar to those observed in swamp-fever horses. Such lesions have also been seen by various observers in conditions other than swamp fever. It would seem that heart lesions by themselves are not sufficient to establish a diagnosis of swamp fever.

Another difficulty in separating swamp-fever cases from cases of verminous infestation is in the fact that edemas of the abdomen, breast and limbs are common to both conditions. In concluding these brief remarks concerning the lesions that we have observed in swamp-fever cases complicated with verminous infestation, it should be stated emphatically that there is no actual evidence that worms

have anything to do with swamp fever, though it is not impossible that the injurious effects of worms are greater in animals that are suffering simultaneously from swamp fever. That the cases we observed in the field were in fact swamp fever was proved in several instances at least by blood inoculations into experimental horses. Experiments in feeding to horses the infective stages of parasites contained in cultures of feces from swamp-fever horses were in every case negative. Likewise, injections of worms taken from horses suffering with swamp fever failed to reproduce the disease. The only possible exception was the case of one horse which showed the first symptoms of swamp fever five months after inoculation. As this animal had in the meantime been more or less associated with horses affected with swamp fever, no serious importance can be attached to this result, notwithstanding the fact that the disease appeared in the early spring, whereas the disease naturally appears in the late summer and early autumn.

With reference to the blood, in the cases that we studied, smears were taken from a large number of the animals, and differential counts of the leucocytes were made. The blood picture which has been repeatedly described by various workers including Van Es, Harris, Schalk, Theiler, Mack and others shows in the first place that the mononuclear leucocytes are increased, and we have found them sometimes practically as high as 100 per cent, commonly 60 to 80 per cent. This increase in mononuclears is undoubtedly an important point in connection with the diagnosis of the disease. In moribund cases, however, it may be observed that the polynuclears increase in numbers and may come back almost to normal, the mononuclears being correspondingly reduced. The eosinophiles in many cases were noted by us to be diminished in number and sometimes altogether absent from the peripheral blood. This fact has been observed by others without special comment. This diminution may be due either to a displacement by other cells that are increased in number, or perhaps to the withdrawal of the eosinophiles from the general circulation and their local accumulation in certain organs and tissues, especially in lesions produced by parasites. As an example of such local accumulations, smears made from verminous ulcers in the colon show eosinophiles in enormous numbers. The same is true of the tissues surrounding the parasites in other locations.

In connection with the eosinophiles it is of interest to note that Weinberg and Seguin have shown that the eosinophiles apparently

play a part in the protection of the organism against parasitic invasions, particularly in the neutralization of verminous toxins. In fact it has been demonstrated that bacteria bathed in verminous juices are picked up by eosinophiles, indicating that these cells become phagocytic to bacteria because the verminous substances render them attractive to the eosinophiles, stimulating the latter to phagocytic activity. Whether the number of eosinophiles in the general circulation could be raised artificially was tested experimentally by us, by injecting verminous juices or extracts of dried worms subcutaneously into healthy horses. The results showed that the percentage of eosinophiles frequently increases after such injections. In one instance they increased to 20 per cent from an original percentage of 6.8. This high percentage was found three days after the second injection of verminous material. In horses the normal percentage of eosinophiles appears to be about 3 or 4 per cent, and natural eosinophilias as high as 20 per cent are very rare. Natural eosinophilias in the horse are thus of a lower percentage than those commonly observed in other animals suffering from parasitic infestation. The statements frequently made as to eosinophilia in horses infested with parasites are somewhat misleading, as in gross infestations the percentage may be very low, especially if the parasitism is complicated with swamp fever.

In conclusion it may be stated that from our experience thus far we have found no evidence of a definite relation between parasitic worms and swamp fever. On the other hand we believe that in the study of swamp fever it is very necessary to give careful attention to the parasitic conditions that complicate the disease, otherwise misleading and false deductions are very liable to be made.

DURING Dr. Mayo's recent visit to Havana, he called upon Dr. Etchegoyan, Dean of the Veterinary School of the University of Havana. This school was established under the second American intervention, and Dr. Mayo was one of the board appointed by the Governor to examine the applicants for professorships in the college. The veterinary school does not appear to be making great progress on account of the lack of appropriations, and there are practically few opportunities for clinical instruction. A few senior students were taking advantage of Dr. Etchegoyan's private hospital for practical clinical work.

The Agricultural Experiment Station with which Dr. Mayo was formerly connected is doing very little work along scientific lines.

A COMPARATIVE STUDY OF THE LONG BONES IN INFECTIOUS EQUINE ANEMIA AND OTHER CONDITIONS[1]

By LEWIS H. WRIGHT

University of Nevada, Reno, Nev.

NEARLY all of the investigators of the disease of equines known as infectious equine anemia, equine anemia, infectious anemia, swamp fever and other names have drawn particular attention to the changes occurring in the marrow of the long bones, especially the humerus and the femur. The following references are typical of the many articles that have been written regarding these changes.

Hutyra and Marek[2] say in part as follows:

"Conspicuous and constant changes are present in the bone marrow. In the proximal long bones of the extremities, especially so in the bones of the upper thigh or upper arm, the bone marrow is changed, either for its entire length or only in parts, to a dark brownish-red or blackish-red mass. In the cases with slower course only various sized circumscribed areas are found in the fat marrow or this may appear normal. At the same time, however, the spongy bone marrow shows the above changes or at least a reddish discoloration. The spongy bone marrow of the vertebræ, ribs, etc., manifests similar changes. Even in the most chronic cases at least small hemorrhages are found, which, however, appear of a peculiar ink-black color if of earlier origin. This condition of the bone marrow does not result from hemorrhages, but represents, as in older losses of blood in general, only a regenerative process, and consists in an increased activity of the blood-forming elements of the red marrow areas, the normal occurrence of which in the fat or gelatinous marrow, especially in the femur and humerus, was already indicated by Skiba."

Udall and Fitch[3] describe the condition of the bones as follows:

"Bone: On sectioning, the long bones, particularly the femur and humerus, show the most pronounced lesions. In the proximal ends of these bones the bone marrow is changed either wholly or in circumscribed portions. These areas are either a reddish brown or a bright red. The spongy bone marrow of the ribs, vertebræ, etc., show similar changes."

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[1] Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

[2] *Hutyra and Marek:* Special Pathology and Therapeutics of the Diseases of Domestic Animals. Authorized American Edition, translated by Mohler and Eichhorn; Vol. I, 1916, p. 924.

[3] *Udall and Fitch:* Preliminary Report on the Recognition of Swamp Fever or Infectious Anemia in New York State. Cornell Veterinarian, Vol. V, No. 2, p. 73.

They also state that "these areas are not hemorrhagic as might be supposed, but are due apparently to an increased activity of the blood-forming elements in the bone marrow."

Mack[4] states that "the changes in the bone marrow in fatal cases are profound and constitute a complex subject." In one case he found "the marrow in the ribs, vertebræ and pelvis very much darker in color than is that in healthy horses. The marrow in the shafts of some of the long bones was a deep, dark red in color. This condition was marked in the humerus, intense in the femur."

In another case he notes:

"The changes in the bone marrow were profound. The occipital, vertebral, and pelvic marrow was much darker than normal, the scapular somewhat so. The costal marrow seemed normal. In the femurs the greater part of the proximal and much of the distal ends and the marrow in the shafts was a very dark red in color. That in the tibiæ was similar to the femur except that the color was less intense. In the humerus portions of the ends and the greater part of that in the shaft were dark red; there were some yellow areas in the shaft, and a yellow margin about 1–1.5 cm. deep under the articular surfaces, beneath which it was very dark. The radius was similarly affected, but less intensely, the metatarsus slightly so."

Van Es, Harris and Schalk[5] say:

"It is possible that the bone marrow lesions constitute a valuable aid in the postmortem diagnosis of the disease, but in view of the fact that we know comparatively so little of bone marrow changes in connection with other diseases of the horse, or even under varying normal conditions, we would rather suspend judgment relating to their diagnostic value until the matter has been looked into more fully."

In some cases they found hyperplasia, in others hemorrhages of the marrow.

The Japanese Commission[6] found that the "changes of the bone marrow are very marked next to those of the blood. In the acute cases the cross section of the long bones, such as the femur and humerus, shows that the bone marrow changes wholly or in part into dark red with petechiæ. In the chronic cases, the change is not so extensive as in the acute form, but it develops as the foci. In the protracted cases a small number of foci are invariably present."

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[4] *W. B. Mack:* Equine Anemia. Bulletin 68, Nevada Agricultural Experiment Station.

[5] *Van Es, Harris and Schalk:* Swamp Fever in Horses. Bulletin 94, North Dakota Agricultural Experiment Station.

[6] *Japanese Special Commission:* Report on the Results Obtained by the Special Committee for the Investigation of Infectious Anemia Among Horses. Horse Administration Bureau. Tokyo, 1914.

Theiler and Kehoe[7] undertook the study of the bones in this and other conditions. This study was prompted by the "fact that some writers describe the bone marrow in this disease as presenting changes or appearances which may, to a certain extent, be regarded as characteristic of the condition, and especially when other lesions present on autopsy are only those of a septicemic nature or where, for other reasons, the existence of the disease was suspected." After discussing the findings of various authors they state:

"In view of all the above evidence, we therefore considered it advisable to examine the appearance of the bone marrow, not only in cases of animals dying of infectious or pernicious anemia, but also in the case of those which died from other causes or were killed. In a number of animals, therefore, the bone marrow of the humerus and the femur was specially examined with this object in view, and it must be here stated that the results obtained do not allow us to regard the marrow of animals dying of pernicious anemia as presenting any specially characteristic appearance, since exactly similar appearances are to be met with in animals coming to autopsy as a result of death from a large variety of other causes."

Text books of anatomy, physiology and embryology make no mention of the extent of the red marrow in the long bones so far as search of the available literature discloses. Theiler and Kehoe[7] are apparently the only investigators who have published the results of a study of the normal long bone marrow or long bone marrow from the various disease conditions of equines.

The positive diagnosis of infectious equine anemia from general symptoms and autopsy lesions being an impossibility in many cases, it was thought that because so much stress had been placed upon the marrow changes in this disease there was a possibility that these changes might be characteristic. The paucity of literature on the subject made it seem advisable to undertake the comparative study of normal bones and those found in various disease conditions.

These observations were made principally on the femur, humerus and ribs. Other bones, as the radius, tibia, vertebræ, metacarpus, metatarsus and phalanges were observed, but because of their lack of marrow space, as a whole the changes in them are naturally of less importance.

The bones were removed from the carcasses as soon after death as possible. If not sectioned at once they were placed in the refrigerator to retard postmortem changes. Most of the sections

[7] *Theiler and Kehoe:* Infectious or Pernicious Anemia of Equines in South Africa. Third and fourth reports of the Director of Veterinary Research, Union of South Africa, p. 269.

were made longitudinally, attempting to cut directly through the center of the shaft of the bone. Then the cut surface was carefully cleaned of debris and the colored reproductions were made immediately. The smears were made from various portions of the marrow and stained by Giemsa's method.[8]

An attempt has been made to show by these reproductions that many other disease conditions may give a bone marrow that is almost, if not quite, identical with that found in equine anemia cases. It has even been shown that the marrow may be darker in color and more extensive in normal horses than it is in some equine anemia conditions. As for the so-called "embryonic marrow," the nearest approach to this condition that has been found, other than in two colts, was in a case of septicemia. In this case the marrow was of a jam-like consistency.

Considering the fact that the bone marrow is the seat of the formation of red blood cells in the adult, one would expect to find a very active marrow in such conditions as equine anemia, hemorrhage, blood parasites, etc., provided the proper reproductive power of the blood-forming elements was not interfered with. It is possible that there is a direct relation between the reproductive powers of the marrow and the acuteness of the dieases, the degree of the latter being, perhaps, largely due to the failure of the marrow to rapidly increase its production of red cells. The more acute cases here shown have had less red marrow than the more chronic ones. There are also found more normoblasts in the blood in the cases of several weeks' duration than in the very acute ones.

Only a few smears from the marrow have been made, but there is an apparent increase in the activity of the marrow in conditions where there is a loss of red cells. This was especially noticeable in the smears from the horses which were bled. As the references have stated, the increased redness, if there be any, is usually hyperplasia rather than hemorrhage.

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[8] At this point Dr. Wright showed a large number of projectoscope pictures of beautiful colored reproductions of the long bones of horses both in health and disease. Of particular interest were the bones from cases of sclerostomiasis, acute experimental equine anemia, and chronic natural cases of equine anemia.—EDITOR.

EXPERIMENTAL TRANSMISSION OF SWAMP FEVER OR INFECTIOUS ANEMIA BY MEANS OF INSECTS[1]

By JOHN W. SCOTT

Department of Parasitology and Zoology, University of Wyoming, Agricultural College and Experiment Station, Laramie, Wyo.

THIS very insidious, obscure, and important disease of equines, of very wide geographical distribution, and known for more than three-quarters of a century, still furnishes many elusive problems yet to be answered.

1. What is the real nature of the virus? Is it a protozoan or a bacterium, or does it belong to that group of organisms that are not distinguishable as either plant or animal?

2. The virus is evidently capable of reproducing by some method within the horse's body. Is it also capable of reproducing by another method outside of the body of equines?

3. In accordance with a common popular belief, is the virus capable of living free and reproducing independently of any warm-blooded animal?

4. Or has the habit of parasitism become so fixed that horses' or asses' blood is absolutely necessary in order to complete the life history of the organism?

5. Is the blood of a swamp-fever case equally virulent at all times in the course of the disease?

6. We know something of the factors that apparently decrease the virulence of the organism. What are the conditions that increase its virulence?

7. As suggested by some writers, does the amount of virus inoculated bear an inverse relation to the length of the incubation period?

8. Is the virus present at all times in the urine, or only at certain intervals?

9. Does the virus have any other avenue of escape from the body?

10. What are the best measures to take for controlling and eradicating the disease?

These and many others are all questions worthy of consideration, investigation and elucidation.

At the Wyoming experiment station we have confined most of our work to an investigation of methods of transmitting the disease.

[1] Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

Considering our present information in regard to the nature and the life cycle of the virus, it is believed that a better knowledge of the possible methods of transmitting swamp fever affords the best and surest means of satisfactory control. When the writer took charge of the work his predecessor, Dr. L. D. Swingle, had made numerous attempts to transmit the disease by feeding various quantities of blood and urine that came from horses infected with swamp fever. He had obtained uniformly negative results, even though large quantities of blood and urine were sometimes used. A study of the literature revealed the fact that while some investigators had succeeded in transmitting the disease by feeding blood or giving food or drink contaminated with infective urine, it had always been a difficult matter. The quantities required for infection were also very large as compared with the quantity required for inoculation through the skin; in fact the quantities were much larger than a horse would likely obtain in a whole lifetime under natural conditions. This work showed the difficulty invariably experienced in attempts to inoculate the virus through the alimentary canal. The current theory, first proposed by Carre and Vallee, that natural infection occurs as the result of contaminating food and drink with urine from diseased horses, did not seem to be an adequate hypothesis to explain the spread of the disease.

From this study, considering what was known of seasonal infection and the history of epidemics, we came to the conclusion that it did not seem possible to account for all transmissions on the urine-contamination theory. The following question then arose: If transmission by way of the alimentary canal was inadequate to account for all cases of transmission, was it possible to obtain transmissions of the disease by any other method? Were there any possible or probable natural methods by which the virus could be inoculated through the skin? From that time (1913) we decided to confine our investigations, for a while at least, to the problem of external transmission.

External transmission or inoculation may be conceived of as possible by means of (1) abrasions, scratches or cuts in the skin or (2) by means of certain agents or vectors actually carrying the infective blood from one horse to another on the mouth parts, such as is known to be true of certain biting insects. Cuts, scratches and abrasions were at once excluded as possible avenues of infection on account of their accidental character and because they do not conform in incidence to the seasonal distribution of swamp fever.

On similar grounds it was found that lice, scab parasites and ticks could be eliminated from the list of possible carriers of the disease. So if external inoculation of the virus was a natural method of propagating swamp fever the only agents left, in Wyoming, were certain biting flies and mosquitoes. Accordingly in the spring of 1914 we began the series of tests which has led us to some very interesting results.

Space does not permit me to give the details of our experiments in this report. Those interested will probably find a full account published later in the *Journal of Agricultural Research*. Some phases of the work have already been published in Bulletin 121 of the Wyoming Agricultural Experiment Station. I shall give here only a general summary of the experiments together with the results obtained.

EXPERIMENTS WITH MOSQUITOES

A screen cage was constructed capable of holding five horses. Aquaria were introduced and stocked with larvæ and pupæ. Later wild adult mosquitoes were caught and put into the cage. A chronic case of swamp fever was then put into this screened cage for a few days. Mosquitoes were observed to bite him freely. Next the diseased horse was removed and three well horses were introduced and allowed to remain for a considerable period. The three well horses gave no evidence of taking the disease either at this time or later.

A second experiment was tried the following year in which swamp-fever horses, well horses and mosquitoes were all kept in the cage at the same time. Only negative results were obtained.

While not conclusive, the results of these experiments led us to believe that mosquitoes do not ordinarily act as agents in transmitting swamp fever. Accordingly our attention was turned in other directions.

EXPERIMENTS WITH BITING FLIES

A preliminary experiment was described some years ago. Two sick and three well horses were confined in separate stalls in a screened cage. A great many flies including house flies, stable flies and numerous species of wild flies were captured and put in with the horses. The house flies (*Musca domestica*) and stable flies (*Stomoxys calcitrans*) thrived and propagated in great numbers; the other wild flies very quickly died and disappeared. Two of the well horses became infected with swamp fever, one developing into an acute or a semi-acute, the other into a chronic case. Since house

flies do not bite, and since the other wild flies quickly died, it was concluded that the *stable flies were probably responsible for transmitting the disease.* Of course this experiment did not avoid the criticism that the transmission may have taken place by contamination.

OTHER EXPERIMENTS WITH STOMOXYS

Near the end of the season in 1914 a second screened cage was hastily constructed and three well horses were confined in it. Many hundred flies, some of which had undoubtedly bitten the diseased horses, were then taken from the first cage and put in with these horses. One of the well horses gave a mild reaction which developed into a severe case of swamp fever by the following summer.

It was next determined to test the insect hypothesis of transmission in a more crucial way. A third screened cage was constructed similar to the first. Three horses with swamp fever were available for experiment. These were kept going in rotation through the two cages so that both cages were exposed alike to contamination. Three well horses were kept in one cage and two well horses in the other. Stable flies were introduced and raised in the first cage, and except for an occasional house fly the other cage was kept fly-free. Two out of three of the well horses in the cage with stable flies took the disease, while neither one of the two well horses in the other cage gave evidence of becoming infected with swamp fever. This experiment seemed to prove that the stable fly and not contamination was the means of transmitting the disease.

The following season, in 1916, after a thorough cleaning of the two cages, horses with swamp fever were confined exclusively to one cage and well horses to the other. Stable flies confined in small, boxlike screen cages were exposed to and allowed to bite the backs of the diseased horses; they were then carried to the other cage and in a similar way allowed to bite the back of a well horse. This horse developed a mild chronic case of swamp fever which, after two years, resulted fatally. This same method of procedure has been used on three other horses. One died by accident before the result was known, one developed a chronic case which is still running, and the other failed to give any clear evidence of infection.

From these experiments we concluded that *Stomoxys calcitrans* is capable of transmitting and probably does act as a vector in spreading the disease known as infectious anemia or swamp fever, especially if the flies are present in large numbers and the conditions are favorable for interrupted feeding.

EXPERIMENTS WITH TABANUS

The only species of Tabanidæ we have found available in sufficient numbers for experiment on the Laramie plains is *Tabanus septentrionalis* Loew (identified by Dr. J. S. Hine). By using small screen cages and the interrupted feeding method as described for the stable fly in 1916, three horses were used, one in 1916 and two in 1917. The old mare used in 1916 developed a mild chronic case that resulted fatally after about 15 months. Of the two horses used in 1917, one died within a month after developing a severe case of swamp fever, while the other failed to become infected.

From these experiments it seems entirely probable that Tabanids, particularly *T. septentrionalis*, are also capable of transmitting swamp fever.

EXPERIMENTS WITH INFECTIVE NEEDLE

If it is true that certain biting flies are capable of transmitting the disease known as swamp fever, then the inoculation of a very small amount of the virus ought to produce the disease, at least in some horses. With this idea in view a medium fine hypodermic needle was used to pierce the skin of an infected horse in one cage and, without disinfecting, was then used to pierce the skin of a well horse in the other cage. Two horses were used. One of these developed a mild case in which the horse apparently fully recovered. The other failed to become infected. So far as it goes, this result tends to confirm the results obtained with insects, for the amount of infecting material clinging to a hypodermic needle as it pierces the skin is probably no larger than that adhering to the mouth parts of biting flies.

CONCLUSIONS

This gives a general summary of some of the principal experiments we have tried with insects in transmitting swamp fever. It is believed that they afford conclusive proof that certain biting flies, *Stomoxys calcitrans* and *Tabanus septentrionalis* in particular, are capable of transmitting infectious anemia of horses.

As the result of pasturing and penning experiments the Japanese Commission in 1914 came to the general conclusion that probably certain Tabanidæ were responsible for transmitting swamp fever. I understand that Dr. Ransom of Washington has repeated similar penning experiments with similar results. Our own experiments have been more specific and, I believe, more conclusive than those of the Japanese.

SUGGESTIONS FOR CONTROL

If we accept as a fact the hypothesis that stable flies and certain horseflies are capable of transmitting swamp fever, certain measures of control acquire added importance. It is evident that we can take no adequate measures of control aimed directly at the parasite that produces swamp fever, for the reason that the organism has not been found. It is also impossible so far to build up an artificial immunity in uninfected animals, and no methods of treatment reach the organism that produces the disease. Consequently any measures we may take for satisfactory control should include the following suggestions:

1. All known cases of swamp fever should be immediately killed or carefully isolated. This is particularly important during the season when biting flies are most abundant. Since many of the infected horses will die anyway, and the remainder act as carriers of the virus, it is usually best to kill all serious cases at once in order to avoid the expense of their care and feed. All dead infected horses should be carefully burned or deeply buried.

2. If the affected cases are not killed at once, all well horses should be segregated from the sick or suspected horses, so that biting flies do not readily pass from one to the other. Suspected cases should then be carefully watched for a lengthy period until the diagnosis is verified or disproved. The isolation of affected horses probably should be permanent, but is of greatest importance during the infective season.

3. Since the incubation period may vary from a few days to several weeks, and probably in some cases several months, it is highly important that a careful watch be kept over all horses that have been exposed to infection. Daily temperatures should be taken, and if a horse shows sudden fever or any other symptom of the disease it should be isolated for further observation.

4. The chronic or healthy carrier probably affords the most important method of spreading the disease from one district to another. The detection of such carrier is the most difficult problem in the control of swamp fever. After they are discovered under no circumstances should they be sold or allowed to be taken from one ranch or district to another.

5. As a control measure, it is without doubt best to suspend all movements or shipments of horses from a swamp-fever area during and for some time beyond the infective season. Horses in poor condition, or suspicious cases, should not be moved from an infected

area at any time. Ranchmen and farmers should likewise exercise great care in buying new horses from an infected area. If horses are purchased from such an area they should be kept apart three months or more for observation before turning them in with horses that are known to be free from the disease.

For further explanation and suggested measures of control the reader is referred to Bulletin 121 of the Wyoming Agricultural Experiment Station.

Dr. Emile Eyquem of Santiago de Chile was a recent visitor in Washington, where he spent 10 days in reviewing the activities of the Bureau of Animal Industry. Dr. Eyquam was attending the International Veterinary Congress in London when the World War broke out. He immediately offered his services to France, the birthplace of his parents, and served throughout the struggle and with the Army of Occupation on the Rhine. He is now en route to Chile, where he will assume charge of that Government's work in the control and eradication of contagious diseases. His interest in having the next International Veterinary Congress in the United States was very marked, and a large delegation from South America was promised.

Dr. W. H. Lynch of Portland, Maine, was recently appointed State Live-Stock Sanitary Commissioner by Governor Carl E. Millikin, for the ensuing term of four years, and has moved to Augusta. Dr. Lynch succeeds Mr. B. B. Bearce and is the second veterinarian to hold this position in the State's history. Wearing three service stripes, Dr. Lynch returned to New England from France last spring, a veteran of the 26th Division in the World War.

Warm letters of congratulation containing gratifying assurances of support have been received by Dr. Lynch from veterinarians of every section of the State.

Dr. F. W. Chamberlain, East Lansing, Mich., was recently made Dean of the Division of Veterinary Science. Michigan Agricultural College, vice R. P. Lyman, who had served in that capacity since the organization of this veterinary school. Dr. Lyman still resides at East Lansing, but is now associated with a large mortgage and bonding corporation of Lansing. The JOURNAL wishes both Drs. Chamberlain and Lyman much success in their new undertakings.

IMPACTION IN THE HORSE[1]

By H. A. TRIPPEER

Walla Walla, Wash.

IN the extreme Northwest the prevailing food for horses is wheat hay, straw or alfalfa. Grain consists of barley or oats.

Forty per cent of my practice is gut trouble. The probable reasons for such a high proportion of such ailments are many animals on ranch, big teams, unbalanced ration, feeding or watering at improper time, and insufficient water or feeding without water when animal is tired. In stock other than work stock it may be due to too much feed and insufficient exercise, in addition to unbalanced ration.

When fed straw or run to straw in winter months, 80 per cent of cases of impaction are of the cecum, 5 per cent of diaphragmatic flexor of great colon, 10 per cent free end of great colon, and 5 per cent floating colon and rectal ring impaction. When barley is fed as a concentrate with any of the above rough forage, cases of diaphragmatic pack are increased and those of the cecum decreased. When alfalfa is the sole rough forage and no concentrates are fed 85 per cent of packs are of floating colon and rectal ring, 10 per cent of free end of great colon, 3 per cent diaphragmatic, and 2 per cent of cecum. If barley is fed, diaphragmatic flexor packs increase and floaters decrease.

Quarters to my liking are stalks and cold-water hydrant, circular box stall 22 feet in diameter, earth floor saucer shaped (center of floor 30 inches lower than outside edge), rings in wall for holding patient at desired angle, and rawhide mat 2 inches thick by 24 by 48 inches, also plumbers' friend slipped over an inch hose.

All diagnoses are made per rectum. Subject is led into stalks, slings put on, temperature and pulse taken, membranes of oral cavity and expression of face observed. I scrutinize exterior of patient for trauma, rupture, etc. If patient is flatulent, paracentesis is performed. After reduction has been accomplished the tail is gently pulled to the left with left hand and anus is lubricated with some good soap in right hand. The cold-water hose is now inserted and water allowed to run in at about 1 gallon in 30 seconds. This is continued for 3 to 5 minutes, a sufficient time to empty completely

[1] Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

and balloon the rectum. Then tail is changed to right hand and operator steps to right side of median line of patient and inserts left hand into rectum in search of offender.

If rectal ring is clear, pass hand through ring and as far as possible into the gut, being on the alert for anything that hampers your entrance. If after passing through rectal ring your course is directed to the left and ballooned with water, look for an obstruction in posterior third of floating colon. If the gut seems to be collapsed and your attention is attracted by a cord two or three inches in diameter running from right lumbar region to the left downward and forward, you are likely to find obstruction in anterior two-thirds of floating colon. By applyinng gentle traction on cord just described you are usually able to pull gut back to where it has the same touch as if it was in posterior third. When this is accomplished gently stroke the hand to the right as far as possible, then suddenly release this hold and attempt to pick up something in abdominal floor just to left of madian line. If you were successful and picked up the offending mass, gently bring it back to brim of pelvis; hold it loosely in this position for a few moments, then gently carry it to right and up, and then slightly retract the hand, and you have the pack in pelvic cavity, ready to massage.

If the pack can not be readily located in this manner, take the subject to a box stall, cast on left side, crossing two front and right hind leg, leaving lower hind leg loose; pull animal to desired slope, and proceed as before.

After the mass has been fixed into pelvic cavity I select the most feasible spot for my massaging process, using first joint of thumb on left hand to press groove in the mass, the fingers of same hand to fix gut. After some experience one can readily locate point of least resistance. My first aim is to get a groove worked longitudinally; if when this is accomplished one can feel the gas passing between fecal mass and gut wall this is very encouraging, as you may leave the patient for two or three hours, as you have relief right then; but be sure to keep the gut posterior to the pack moderately filled with cold tap water. Usually when your next treatment is given you can detect a decided softening in the groove; when this is so I am soon able to break it horizontally. If it is extremely obstinate and the subject be a female, the mass is held in pelvic cavity with left hand and massaged with right through vagina; but if it is a male and the rectum is so that you can work both hands in

the rectum, do not do this, as the strain on the gut is too strenuous and produces paresis of the gut.

Just stick to the job and use the hand that is best educated to this work, being careful not to let the thumb slip off when pressure is applied.

After the mass has been broken up there is usually a three-cornered piece that will need cold-water douches and stimulants, such as:

Sodii chlorid.....	60.0
Saccharum	60.0
Nux vomicæ pulv.....	6.0

Give every 4 hours in warm water per orum.

In free-end impactions of great colon, massage longitudinally. Cast, cross tie all four feet, and rotate so as to massage all surfaces of free end. Use same stimulants as in floating colon troubles.

In diaphragmatic and colon-head obstruction use:

Sodii chlorid.....	60.0
Saccharum	60.0
Nux vomicæ pulv.....	8.0

Administer per orum in quart of hot water every 3 hours until 5 doses have been given. Follow this immediately with arecolin ½ grain; in 15 minutes follow with ¼ or ½ grain, according to action you are getting.

In impaction of cecum, cast animal on right side and cross tie two front and left hind leg, leaving right hind leg loose so that it pushes head of cecum nearer to center of cavity. Massage with ball of fingers and heel of hand. Give same stimulants as for great-colon impactions, 18 to 24 hours. Then give 5 cakes of yeast in 3 gallons of warm water with stomach tube. In 30 to 45 minutes give arecolin as in great-colon trouble, if flatulency is not pronounced; if so, tap. If pain is severe for 10 minutes at a time wait until pain subsides to give arecolin. Withhold stimulants for 6 hours, massage, and repeat stimulants.

GENERAL OBSERVATIONS

It is practicable and absolutely necessary to cast and tie a high per cent of subjects.

When the subject is 1 year old or over and normal in size, has not been previously treated in any manner, pulse under 90, temperature less than 106°, a practitioner skilled in this line can break down and save 95 per cent of floating colon impactions in females and 90 per cent in males.

The reason for females being more favorable is that the operator can use both hands on obstruction, right hand in vagina and left hand in rectum. It is not possible to injure wall of vagina if it has been douched with cold water. All enemas should be at a temperature of 50 to 60° F. The gut will stand many times the manipulating and subject will not strain. In some subjects, especially young, I may have an abrasion on left side of rectum from elbow pressure. This is not troublesome; cold water douches t. i. d. will handle it. In 12 years' practice I have handled 3,600 gut troubles and never ruptured a gut by rectal manipulation.

Twenty per cent of cecum packs and 80 per cent of diaphragmatic and colon-head packs are fatal.

A long arm is unnecessary to be successful in this work, but a small hand is indispensable. A large hand and unsensitive touch may mean death to the subject. An operator with long radius can not make the flexion necessary to elevate pack into pelvic cavity.

Let the subject have free access to water. A small dose of arecolin will stimulate thirst many times. Get all the water possible into subject per orum and rectum.

Do not feed any until obstruction has been removed and three or more normal evacuations have taken place and plenty of water has been consumed; then only hay for 3 to 5 minutes at a time; repeat in 3 or 4 hours; gradually increase up to 3 or 5 days before returning to full feed.

No exercise should be given except in cases of cecum pack, and they should be galloped to a sweat before second stimulant treatment is commenced. No other medication has been efficient in my hands.

The floating colon will allow 15 to 18 pounds pressure from ball of thumb.

BELGIAN VETERINARIANS

THE Belgian veterinarians who return to their prewar residence or to a neighboring locality may obtain from the Belgian Ministry of Agriculture an advance of 10,000 francs on account of the war damages due them. In addition they will receive a monthly indemnity of not more than 500 francs. This indemnity is subject to progressive reduction in the proportion that they find resources in the exercise of their profession.

DIAGNOSIS OF BOVINE CONTAGIOUS ABORTION[1]

By C. P. FITCH

University Farm, St. Paul, Minn.

THE diagnosis of an infectious disease can usually be divided into three main procedures: (1) Physical examination, including a careful inquiry into the history of the outbreak; (2) laboratory and clinical tests; (3) postmortem findings. In many cases one of these procedures carefully carried out gives definite results, but there are instances when all three are necessary in order to establish a definite diagnosis. The diagnosis of hog cholera, for example, is almost always made on the basis of history, symtomatology and autopsy findings. The practical value of the laboratory tests in the diagnosis of hog cholera is slight because of the long time necessary in order to get positive results as well as the expense of the procedure. Rabies, however, often if not usually requires laboratory procedure in order to determine positively the presence or absence of the disease.

The diagnosis of contagious abortion for many years was shadowed in obscurity. This was due to several conditions, the principal one being the failure to recognize the etiological agent. The eating of spoiled feeds or plants affected with different molds or fungi which were thought to have a specific action on the uterus was considered to be responsible for many abortions. Mechanical injury or so-called accidental abortion was considered the cause of many of the failures to produce a living calf at full time. Due to the researches of Bang, McFadyean, Williams and many others we have gradually come to recognize that abortions due to other than infective agents are few and the losses resulting from such abortions are in the aggregate trivial. Therefore, the diagnosis of abortion has simplified itself in at least one respect, namely, that the losses resulting from this disease are due to the action of a specific infective agent.

On the other hand we have learned that the act of abortion is simply one symptom of the disease. Pathological changes in the various genital organs, causing various forms of sterility, have been shown to be due in a large measure to the ravages of this infection. White scours and calf pneumonia have also a close association with this

[1] Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

widespread disease. The problem of the diagnosis of this disease has simplified itself in one way only to become exceedingly complicated in another.

It is the purpose of this paper to discuss the various methods which can be used in the diagnosis of this infection and to attempt to point out the relative value of each so far as we are able in the light of our present knowledge. It must be kept clearly in mind that in many phases of the disease our knowledge is very imperfect and that various research workers are contributing continuously to the literature on this infection.

SYMPTOMS AND HISTORY

The symptoms of an impending abortion are varied. Sometimes abortions occur without premonitary symptoms. This is especially true when the abortion occurs early in pregnancy. The small fetus is discharged with its membranes and nothing unusual is noted until the cow comes in heat. The usual prodromal symptoms are swelling of the vulva, more or less edema of the udder and distention of the teats. The mucous membranes of the vulva and vagina are reddened and a glairy mucus in considerable quantities smears the external vulva and tail. Sometimes this mucus is tinged with blood. The pelvic broad ligaments are relaxed and uneasy movements of the animal with severe straining are often noticed. If the abortion occurs somewhat late in pregnancy a considerable quantity of a yellowish, brownish or sometimes greenish discharge is present. This is the so-called "abortion exudate," and at first it is odorless. It is usually flocculent, containing both fibrin and leucocytes. Heifers frequently and cows occasionally during the fifth or sixth month of pregnancy not uncommonly may show the udder and vulva changes noted above and not abort, the glandular activity subsiding after a few days.

It is exceedingly important to obtain an accurate history of the case. This should include the purchase of new animals both male and female, the number of animals failing to breed in the herd, the presence or absence of white scours, the age of the animals aborting, and the careful examination and history of the sire. One of the most important things to note is the presence or absence of retained placenta. Researches have shown that this condition is the result of infection and that it usually follows an abortion occurring after the fifth month. Retained placenta occurs, however, in many cases where a live calf has been delivered at full time, and here it is a significant sign that the infection of abortion is present in the herd.

The *essential point* to keep in mind in regard to the symptomatology is that abortions often occur without premonitory symptoms and a rich source of infection goes unnoticed.

LABORATORY AND CLINICAL TESTS

The laboratory and clinical tests which have been used to diagnose contagious abortion include (1) a bacteriological examination of the exudate or organs of the fetus, (2) the abortin test, (3) precipitation, (4) agglutination, and (5) the complement-fixation test.

Bacteriological Examination

The bacteriological examination to determine the presence or absence of abortion usually consists of smear preparations made from the cotyledons or exudates, cultures and guinea-pig inoculations. The *Bacterium abortus* Bang does not stain easily, and carbol fuchsin seems to be the preferable stain to employ, allowing it to act for some time or employing heat to hasten and intensify its action. Smith uses alkaline methylene blue to stain the spirillum isolated from cases of abortion by himself. Some authors state that the finding of a short rod in the smears made from the suspected material constitutes a presumptive diagnosis of abortion. We question whether one is able to make anything like a positive statement in regard to the presence or absence of abortion as a result of the examination of smear preparations. Moore and others have shown that the colon organism is often found in connection with abortions, and the variation of morphology between the colon and Bang organisms is not sufficient in all cases to enable one to distinguish positively between them. The chief value of smear preparations consists in determining the morphology of the organsims associated with the disease. Researches have shown that organisms of varying morphology (spirilli, streptococci, rods) may be associated with this disease, and smears are exceedingly valuable in giving a hint as to the varieties of micro-organisms which are present.

Cultures are valuable, but often are so badly contaminated with saprophytes that the causative organism is completely obscured. Cultures made from the fourth stomach of the recently aborted fetus seem to yield the best results when *Bact. abortus* Bang is the causative organism. Smith has gotten pure cultures of the spirillum found in cases of abortion from the fourth stomach, meconium and the lung tissues of the fetus. Stockman reports the isolation of a vibrio in pure culture from the fetal stomach in three outbreaks of

abortion among cattle. Wall has cultivated *Bacillus pyogenes*, *Streptococcus pyogenes* and other bacteria from the uterus of aborting cows. We have cultivated a streptococcus from the amniotic fluid of a fetus. Guinea pigs when inoculated with exudate or glandular material containing living *Bact. abortus* Bang develop the typical lesions of this disease in the spleen. The organism may also be isolated less constantly from the testicles, kidneys and bones.

The so-called guinea-pig test for the presence or absence of *Bact. abortus* is of value when the material is badly contaminated and cultures are useless. The natural protective forces of the guinea pig often destroy the contaminating organisms. On the other hand, if the material contains pyogenic or septic organisms, particularly anaerobes, the pigs will die within one to ten days before the abortion germ has started to produce lesions.

The value of these bacteriological examinations as methods for the routine diagnosis of abortion is not great. They do have an exceedingly great value in throwing light on the variety of organisms which may be associated with this disease. It should be kept clearly in mind, however, that *Bact. abortus* Bang has been isolated in by far the largest number cases and its presence or that of the other organisms mentioned constitutes a positive diagnosis of the disease. We do not believe, in the light of our present knowledge, that we can exclude the presence of infectious abortion when the cultures fail to grow. Smith reports 17.4 per cent of cultures "either sterile or else the digestive and respiratory tracts had been invaded during or after birth with miscellaneous bacteria. *Bacillus abortus* was absent according to cultures and animal tests." He further states that in bacteriological examinations of 109 cases of abortion the following results were obtained: Sixty-two or 57 per cent were associated with *Bacillus abortus*, 26 or 23.8 per cent were associated with spirilla, 2 or 1.8 per cent were associated with *Bacillus pyogenes*. Seddon fails to find *Bact. abortus* in 27 per cent of cows which gave a positive agglutination titre with 0.01 c. c. of serum.

The Abortin Test

The abortin test consists in the application to cattle of a material prepared from *Bact. abortus* analogous to tuberculin. It was first used by McFadyean and Stockman. A review of the literature does not indicate that this test has proved satisfactory for the diagnosis of abortion disease. Belfanti, Zwick and Zeller, Meyer and Hardenberg, Mohler and Traum, and Giltner obtained poor or unsatis-

factory results when using this test. We do not believe that the use of abortin can be recommended for the diagnosis of infectious abortion.

Precipitation

The precipitation test was first used by Szymanowski for the diagnosis of abortion. The results obtained were unsatisfactory. It was later studied by Pfeiller and Drescher and is reported by Pfeiller in his exhaustive report on the value of precipitation in the diagnosis of various diseases. In this report Pfeiller states that the precipitation test is not applicable for the diagnosis of abortion disease because many noninfected animals have considerable quantities of normal precipitin in their blood, and further, many infected animals have very small quantities of precipitin. This test is not satisfactory.

Agglutination

The agglutination test for the diagnosis of abortion was apparently first applied by Holth and Wall in Jensen's laboratory in Copenhagen. Since then it has been studied by many investigators both in the United States and in Europe. Several very important points have been demonstrated in regard to the value of the test in the diagnosis of this disease. Certain of these are well enough established to warrant accepting in the light of our present knowledge. Seddon in 1915 pointed out that more important than the dilution is the actual amount of serum used. In reporting results of the agglutination test one should not only give the dilution of the serum in the respective test tubes, but the actual amount of serum as well.

McFadyean and Stockman as a result of their work state that "One is justified in regarding complete agglutination with a serum dilution of 1-50 or 1-100 as strong evidence of infection." Surface considers an agglutination in dilutions of 1 to 100 or higher as practically certain evidence of infection. Brüll considers a reaction in a dilution of 1-64 as doubtful. Seddon considers that "an agglutination titre of 0.01 c.c. represents infection with *Bacillus abortus*." Cows giving an agglutination with any quantity of serum not exceeding 0.01 c.c. are therefore said to give a positive reaction, whereas those which require a greater amount of serum are considered to give a negative reaction. Rettger and White employed only two dilutions, 1-50 and 1-100. Smillie, Little and Florence consider "an agglutination titre up to and including 1:40 as negative as to the presence of *Bacillus abortus*." They state

further: "In any herd a uniformly low titre (1:40 or less) in all animals may be regarded as indicating the entire absence of *Bact. abortus*. A high titre in any one cow serves to indicate quite definitely the presence of infection in the herd."

The results of the investigators here reported as well as many others lead us to believe that a complete agglutination in a dilution of 1-50, or using approximately 0.02 serum, should be considered as highly suspicious, and a complete agglutination in a dilution of 1-100, or using 0.01 c. c. of serum, as positive evidence of past or present infection with *Bact. abortus* Bang.

The published data on the agglutination test indicate that at least four and preferably six different dilutions or amounts of serum should be used in the routine test of sera. Approximately these amounts and dilutions should be 0.05, 1-25; 0.025, 1-50; 0.01, 1-100; 0.005, 1-200; 0.002, 1-500; 0.001, 1-1,000.

Seddon has shown, and our own work has verified the statement, that occasionally agglutination will not show in the tubes containing the larger amounts of serum, but the reaction will be evidenced in those containing the smaller amounts. This is explained according to Zinsser on the basis of the presence of "pro-agglutinoid." We also believe that some of this inhibition can be avoided by employing only 1 c. c. of test fluid.

It has been shown by Rettger and White that young calves always have the same agglutination titre as their dams. Huddleson concludes as the result of his experiments that "there is no relation between the bacterial antibodies produced in the blood of the dam and that of the aborted fetuses taken from pregnant cows and newborn calves. In other words, agglutinins and complement-fixing bodies are not transmitted from mother to fetus in utero." This latter tends to confirm the work at the Experiment Station at University of Minnesota, which indicates that young calves may have the same reactions as their dams, but some calves are met with which do not. Further work done during the past years tends to bear out this statement.

It has been pretty clearly shown that heifers between the ages of 4 months and 1 year give negative results to the test. Occasionally an animal of this age is found which does react.

Herd bulls react, and in the recent publication of Buck and his associates *Bact. abortus* has been isolated from 4 bulls which gave positive reaction to the test. They conclude as a result of their work that infection of bulls is more strongly indicated by marked

rather than slight reactions to this test. Seddon reports the recovery of *Bact. abortus* from an artificially infected bull which gave an agglutination in a very high titre.

Smillie, Little and Florence studied bacteriologically a number of cases of abortion and also the agglutination reaction of the animals. In 19 animals a spirillum was isolated, and in 11 or approximately 58 per cent of this number the agglutination test was negative. In 42 per cent the agglutination test did not check with the bacteriological findings, but some of these cases can be explained on the basis of past infection. Eleven cases were found in which the fetuses were sterile or associated with a miscellaneous infection. Eight or 73 per cent gave negative reaction and 3 or 27 per cent gave positive reactions. These latter are explained because of previous infections. Forty-four animals had *Bact. abortus* isolated from the milk or fetus. Of this number 8 or 18 per cent gave negative results to the agglutination test. Seddon reports the agglutination test as agreeing with the bacteriological and clinical evidence of abortion disease in 82 per cent of the cases.

Based on the present results of the work on the agglutination test, we believe we are justified in stating that:

1. This test indicates the relative amount of herd infection; that is, a large number of positive reactions in a herd shows a widespread infection with *Bact. abortus*.

2. A positive reaction to the test indicates a past or present infection with the Bang organism. It does not mean that an animal ever has aborted or will ever abort. It may be an index of present immunity.

3. A negative reaction does not show positively that an animal has not aborted or will not abort in a short time.

Complement Fixation

The complement-fixation test was first reported by Holth and Wall in the diagnosis of this disease. Since then it has been reported by a large number of investigators both in this country and in Europe. The results obtained by this test do not seem to vary materially from those of the agglutination test. Giltner, Hallman and Cooledge carefully compared the results of the agglutination and complement-fixation tests on several different groups of animals. As a result of their work they state that "the margin of disagreement between the two tests is not so great as to utterly condemn either or both tests. It is evident that the complement-fixation

test will pick out more reactors than will the agglutination test, but on the other hand animals may react to the agglutination test and not to the complement-fixation test."

The presence of conglutine tends to modify the results of the fixation test, as does also the inactivation of the serum and the inhibition or anticomplementary action when used in low dilutions. These conditions were pointed out respectively by Fitch, Boyd and Billings, Thomsen and Surface.

The complexity of the technic of complement fixation as compared with agglutination is a factor which renders the latter the more valuable. Mohler and Traum state that in their experience "only in doubtful cases would it be necessary to refer to the more complex complement-fixation method." We believe that only in exceptional cases is it necessary to employ the complement-fixation test, that as a routine test it has no advantage over the agglutination method, and that it has certain specific disadvantages not possessed by this test.

POSTMORTEM FINDINGS

The gross postmortem findings in abortion disease are not usually pronounced. There is usually present subchorionic edema as a result of a gelatinous infiltration. The so-called typical abortion exudate may be present, widespread over the placental cotyledons. The cotyledons themselves may be a brownish red or a dirty yellow in color. Putrefaction of the fetus rarely occurs. The fetus may be perfectly fresh or in various stages of mummification. More or less edema of the fetus is not rare. The entire uterine contents contain the abortion germ. This is particularly true of the exudate and the chorion over the cotyledons. The contents of the fetal stomach contain the germ with the greatest certainty and purity. There may be present a marked subserous and subcutaneous infiltration with a bloody fluid. A reddish fluid is not rare in the body cavities. Some calves are born covered with the so-called abortion exudate.

CONCLUSIONS

Basing our opinion on the completed researches of the present time, we believe the following conclusions in regard to the diagnosis of abortion are justifiable:

1. Abortions due to other than specific biological agents are rare.
2. The history of physical examination of cases of abortion do not in all cases furnish definite grounds for a diagnosis. They are always, however, valuable adjuncts.

3. Abortin or the precipitation tests are of little if any value.

4. The cultural method is an exceedingly valuable aid in determining the cause of the particular case studied. Negative results from cultures can not exclude the presence of some infective agent.

5. The agglutination test is the most reliable of the serological methods of diagnosis. It will indicate the amount of herd infection. It will not pick out individual aborters. A positive reaction to this test means past or present infection.

6. Guinea-pig inoculation is a valuable method of determining the presence or absence of *Bact. abortus*. Many inoculated pigs, however, die of sepsis.

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Dr. S. L. Bond, inspector in charge of the Bureau of Animal Industry at Louisville, Ky., has resigned to take effect January 15.

THE UNITED STATES ARMY VETERINARY CORPS SERVICE OF THE INTERIOR[1]

By C. J. MARSHALL

Former Assistant Director of the Corps

PROBLEMS OF ORGANIZATION

THE entry of our United States into the great World War created an emergency to which persons in all vocations responded and patriotically placed their services at the disposal of our Government in the lines to which they would be best adapted. In common with others, the veterinary profession throughout the whole country offered its srevices to build up a sufficient and efficient corps to handle the animal-transport and food-inspection branches of army activities. At no period was there a dearth of veterinary assistance. The volunteers were in such numbers that it was difficult to place them promptly in active service, as it was necessary first to establish a proper foundation upon which to build the organization.

An act of Congress, in effect less than a year, had transferred a totally inadequate and loosely organized veterinary branch to the Medical Department of the Army. The extra tasks and responsibilities devolving upon the Surgeon General in command of the Army Medical Department, as the possibilities of war became probabilities, had rendered it impossible for that officer to organize a proper army veterinary service or to acquaint himself with its needs and the capabilities of the few officers then available in that branch. When we were verging upon war a senior veterinary officer and one assistant were called to the Surgeon General's Office at Washington. Their services were given almost entirely to the examining of veterinarians as prospective officers for an enlarged veterinary service. Several hundred young men, fresh from college, with no practical veterinary or military training, were selected and immediately assigned to duties with horse-purchasing boards, remount depots and other important branches wherein they encountered problems of vital importance.

Not only were these young officers unsuited for this work by lack of training, but they were further handicapped by the absence of supplies, equipment, plans and regulations which should have been made available in advance for the proper conduct of their

[1] Address before the fifty-sixth annual meeting, American Veterinary Medical Association, New Orleans, November, 1919.

work. Many of them were hastily commissioned as second lieutenants and sent overseas before they had opportunity to gain even a rudimentary knowledge of army duties.

Horses and mules were daily bought in large numbers and shipped to remount depots that were only in process of construction and unequipped with proper facilities and supplies to care for the great number of hospital cases resultant from exposure to diseases while in transit. The unorganized veterinary service had no enlisted personnel and but few men qualified to supervise the important work thus thrust upon the remount depots. Sickness and deaths among the animals increased to an appalling extent, but no authoritative reports of true conditions were obtainable.

The seriousness of the emergency thus created impelled the Surgeon General to call a number of well-known veterinarians from authoritative positions in civil life to assist in creating a properly organized army veterinary service. Most of the men selected were as inexperienced in military matters as were the younger men who had preceded them into the service, but they had the great advantage of wide practical experience in handling the diseases that were causing so much havoc among public animals. They immediately realized the value of such assistance as would be rendered by veterinary officers experienced in military affairs, and suggested that three of the best-known veterinary officers in the Regular Army be ordered to Washington. The orders, though promptly issued, could not be executed until nearly three months had elapsed, as the services of these officers were almost indispensable in the field and it was difficult to effect their transfer to office duties. Pending their arrival, the office staff as it then existed was virtually without an authoritative head, even though the staff had been in existence for some time. The outlook was extremely discouraging to those at headquarters, as there was an apparent lack of harmony between the senior veterinary officer and the veterinarians from civil life who were endeavoring to save valuable time in placing the veterinary service on an efficient basis. The advisory veterinarians had no army commissions, consequently had less authority than the "one dollar per year men" who were so much in evidence during the later periods of war activities. They continued thus, merely in an advisory capacity, until October 3, 1917, on which date several of them were given the military rank of major. The commissions had not been sought by those who received them, and the conferring of the commissions was regarded with disapproval by some of

the men older in the service, who looked upon the action as an unmilitary way of handling the situation.

With matters thus arranged, progress might have been more rapid if the veterinarians of military experience could have been spared from their commands and permitted to respond more promptly to the order of the Surgeon General.

As the newly created officers became more familiar with military customs and better acquainted with the veterinary officers of the Regular Army, it was found that most of the previous troubles had been due to a perverted imagination or a misunderstanding between the persons concerned. The gap between the civilian and the army viewpoint was gradually bridged and proved not so great with the mutual understanding that all were working for a common cause—an efficient veterinary service.

One of the most important measures undertaken was the preparation of what later became known as "Special Regulations No. 70." Fortunately there was available a copy of the organization of the British Army Veterinary Service, which was conceded by all to be best adaptable to our conditions. Our plan was patterned after the British service as nearly as our army organization and customs would permit. The Secretary of War advised that the proposed plan could be handled under the Overman Act of May 18, 1917, and that additional legislation would not be required.

The task of preparing the regulations was less difficult than that of having them adopted and put into a working order, as much of the material was new to our army officers in general. Those in charge seemed not to have the confidence to give requested authority and responsibility to veterinary officers, apparently basing their opinions on the class of veterinarians who had been taken into the service during the rush at the beginning. They would not believe it possible for veterinarians to possess the necessary administrative abilities. Many personal interviews and conferences and much correspondence were required to persuade them that the work could be successfully handled in accordance with the proposed plan.

Special Regulation No. 70 was finally authorized by the Secretary of War, December 15, 1917. It defined the administrative zones; objects of the veterinary corps; organization of the corps in war; titles of veterinary officers in general; veterinary service of the interior; veterinary service of the theater of operations; supplies and materials.

In the interval between the drafting of the regulations and their

adoption Lieutenant-Colonel R. B. Miller of the Medical Corps was assigned as acting director of the Army Veterinary Corps. This assignment met with the universal approval of those at veterinary headquarters. Lieutenant-Colonel Miller had been in the Army Medical Service for many years and was thoroughly familiar with the customs of the service, the Army Regulations, the Manual of the Medical Department, etc. He proved himself to be of inestimable value to our corps. He was a full master of the situation, absolutely fair and dependable in every way during the short time he was with us, and a most valuable consultant after his assignment to another position in the Medical Service proper. It was through his efforts principally that General Orders No. 130 was obtained on September 25, 1917, which provided commissioned veterinary officers and an enlisted personnel on a percentage basis. He was instrumental also in completing the material for Special Regulations No. 70 and its final adoption. He instituted the weekly telegraphic sick and death reports, which later proved so valuable. The first reports were received December 8, 1917. Up to this time no reports had ever been made of sickness or death among our public animals. He divided the service of the interior into five zones and selected a veterinary officer as general inspector of each zone. This work was started in the early part of December. The importance of such inspections had been demonstrated as early as September 5, when two of the veterinarians on temporary duty had reported the results of their inspections of the remount depots at Front Royal, Va., Fort Reno, Okla., Fort Sam Houston, Texas, and Fort Bliss, Texas, in accordance with Special Orders No. 175, paragraph 105, and Special Orders No. 185, paragraph 26.

In addition to Colonel Miller's assignment as acting director of the Corps, another fortunate circumstance occurred on November 12, 1917. This was the arrival of Lieutenant-Colonel Aitken of the British Veterinary Corps, by orders from His Majesty's Service in response to a request from the Surgeon General. Lieutenant-Colonel Aitken had served in the British Army Veterinary Service for about twenty years. He had seen service in France from the beginning of the war and was thoroughly familiar with the needs for a properly organized service. He worked unceasingly during his six months' assignment in Washington to help place our organization on a foundation of efficiency. He was always just and fearless. His arguments and reasons were usually convincing. He was exasperated at times by the delay in matters which he realized so

well were imperative for the efficincy of our Army. He remarked on one occasion that "every hour we lost in getting ready for action, thousands of good fellows were losing their lives."

When it became necessary to transfer Colonel Miller, Lieutenant-Colonel C. F. Morse of the Medical Corps was assigned to his place in our office. He was eventually appointed director and promoted to the rank of colonel, and has given undivided attention to this work from the time Colonel Miller left to the present time. He has proved a thoroughly efficient officer and is highly respected by all at veterinary headquarters. All that has been said of Colonel Miller's splendid qualifications are equally applicable to Colonel Morse. The only regret ever expressed by our men was that he was not a veterinarian. The fact that he had received no veterinary training militated very little against his success as a director. Our principal troubles were very similar to those in human medicine, with which he was familiar. The more we knew him the more we realized the wisdom of his selection as director. It was not until after his incumbency as director that the headquarters office was able to do much that was of real value and assistance to our men in the field. A large portion of the time before this had been spent in preparation.

Colonel Morse revised Special Regulation No. 70 and made it more valuable and workable in the field. He organized the office force and placed it on a more workable basis. He instituted and systematized reports from the various branches of the service which should prove of inestimable value, and issued many circulars of instructions for standardizing the work in the field in the future. The Veterinary Corps is under great obligations to the Surgeon General of the Army for the able assistance furnished by Colonel Miller and Colonel Morse. The relations between the Surgeon General, the director of the corps and the veterinary officers were most cordial at all times.

It was planned from the first that the entire veterinary service should be placed under the administration of the veterinary officers acting under the orders of the Surgeon General. This was never fully accomplished. For example, our service in remount and embarkation depots was always subservient to the commanding officer of the depot. The veterinary hospital in each of them was constructed and equipped without consulting the Surgeon General's Department, yet the work in them was to be done under his direction. We believed, and are still of the same opinion, that the

remount, embarkation and debarkation depots are not proper places for veterinary hospitals. So far as our service is concerned these depots should be treated the same as a brigade of infantry, a regiment of cavalry, a brigade of field artillery, a regiment of engineers and other mobile organizations. Unfit animals should be collected from them and sent promptly to a hospital well isolated from animals that are in working condition. Plans were completed for such disposal of unfit animals from all organizations except the remount and embarkation depots in the department of the interior. For some unknown reason those in charge preferred to collect the sick, lame and injured animals from all organizations in a camp together in a remount depot and treat them there. This fact militated greatly against giving veterinary officers and enlisted men the training they so much needed in hospital service for overseas duty, and at the same time was a dangerous source for spreading transmissible diseases. Six veterinary officers and 72 enlisted men were assigned to each remount and embarkation depot of 5,000 capacity. Such men had decidedly poor prospects for overseas service, which the majority would have much preferred.

With the exception above stated, for which the Surgeon General's Office was not responsible, the work was organized and conducted at home practically as originally planned. Additional authority obtained from time to time, added to that provided by Special Regulation No. 70, made it possible to organize, train and equip the Veterinary Corps in a decidedly satisfactory and efficient manner.

After January 1, 1918, each division of troops that went abroad was provided with a complete veterinary personnel of 12 officers and 51 enlisted men, organized, equipped and supplied before sailing. The division veterinarian was attached to the staff of the commanding general. He had as assistant a veterinary officer who had been trained in meat and milk inspection. All meat and dairy products used by the troops were carefully inspected before issue. Each division had a trained mobile veterinary section, consisting of 1 veterinary officer and 20 enlisted men, equipped and mounted. The duties of these men were to collect sick, lame, emaciated and wounded animals from divisional organizations and remove them to hospitals or other suitable places for treatment.

Veterinary service was also supplied to all regiments of cavalry, artillery and mounted troops scattered about the country and to all military posts which had a sufficient number of animals to justify the assignment.

VETERINARY TRAINING CAMP SCHOOLS

In addition to the service attached to each division, the Surgeon General's Office was required to organize, train and equip 204 veterinary officers and 8,400 men for veterinary hospitals and mobile units to serve overseas with army corps, armies, at the base and on the lines of communication. Training facilities were afforded for these men at Camp Lee, Va., the veterinary section of the Medical Officers' Training Camp, Camp Greenleaf, Ga., and at Fort Riley, Kans. The school at Camp Lee had a capacity for about 1,800 officers and men. Green men were sent to this school to be trained, equipped, instructed and organized into units for overseas duty. The school had a faculty of line officers for giving military instruction and veterinary officers to teach professional subjects. The commanding officer was Colonel Sturges, a line officer. Lieutenant-Colonel Gerald E. Griffin, the second senior veterinarian of the corps, was his assistant.

The school at Camp Greenleaf was equipped to give instruction to veterinary officers. A class of 75 men was graduated from this place June 20, 1918, and preparations were made to graduate about 100 men each month thereafter. Most of the students were fresh from civil life. The capacity of the school was about 250. It was planned to send veterinary officers from the various organizations to this school for training as fast as their services could be spared and there was room for them at the school. Major Stokes, a Regular Army veterinarian, was the senior veterinary instructor. There were nearly 600 enlisted veterinarians, most of whom were subject to draft and fresh from college, at the school at the time the armistice was signed.

The veterinary section of the Medical Officers' Training Camp at Fort Oglethorpe was the principal veterinary training school maintained during the war. The original purpose was to train commissioned veterinary officers in their military duties and to fit them in the shortest possible time for military service. The time was too short and the demand too urgent to attempt to teach subjects pertaining to veterinary medicine, and the officers as graduates were all supposed to be qualified professionally. Had the war lasted, it was contemplated to expand the curriculum along these lines. The reserve officers were ordered to this school in lots of 100 and were put through a two months' course of instruction intended to be strenuous and intensive, although not more so than that required of the dentists and doctors. It was contemplated to eliminate dead

wood and classify the men as to the nature of the duty for which they were best fitted. At the end of the course they were assigned to divisions, sent to the training school at Camp Lee for duty with veterinary hospital units proceeding overseas, or sent to stations in the United States.

In addition to the officers in training, it was found desirable to maintain a company of enlisted men of the Veterinary Corps for training and for general duty. A considerable number of enlisted men were trained in this company and sent to different stations where as assistants to the veterinary officers they rendered good service.

In the spring of 1918 there arose the question as to the future of the 1918 graduates in veterinary medicine. The men who were within the draft age had been allowed by the Government to enlist in the Medical Enlisted Reserve Corps for the purpose of completing their veterinary education. The Government could have taken them as soldiers at any time, but considered that as individuals they would be of greater value if they were permitted to graduate. In other words, their call into active service as enlisted men was simply delayed to suit the convenience of the Government and for no other reason, nor under the law had they any rights or claims by reason of this delay, and the Government in effect stood ready and had full authority to assign them to immediate duty *as enlisted men* whenever it was deemed expedient. The foregoing facts should be distinctly understood. In certain quarters it has been asserted that a degree of immunity or exemption from service was assured as a special reward for enlistment in the Medical Enlisted Reserve Corps, but nothing could be further from the truth. The Surgeon General's Office looked on these men as a reservoir of future commissioned veterinary officers of great potential value, and needed the services of every man who could qualify.

At the same time there was almost daily evidence of the inefficiency of the veterinary service on the part of the veterinary officer fresh from civil life by reason of his pathetic ignorance of the military machine and his relations thereto. Accordingly a plan was devised for sending the 1918 graduates, as a body, to Camp Greenleaf for three months' training as enlisted men, with the strong conviction that in no other way could they learn the military game from the ground up. This plan likewise presented an opportunity to observe the men and determine their qualifications to an exceptional degree. It was further planned to examine them for com-

missions at the end of the training period; to grade the entire class on the results of their examinations, and to give the successful candidates a course of instruction in the officers' section before sending them to service with troops.

The plan outlined was entirely sound and should have resulted in a large number of newly commissioned officers becoming available by November 15, assuming they would arrive at Camp Greenleaf about July 15. The actual results were disappointing. About the end of June orders were requested for the assignment of the 1918 graduates, who, it should be remembered, were all enlisted men, subject to call. The orders passed from the War Department through the department commanders, and in consequence great and vexatious delay, incident to clerical shortage and difficulty in locating the men, ensued. They trickled into Camp Greenleaf instead of arriving *en masse* in the early days of July. They continued to come through August, September and October, and they numbered about 600.

It was soon apparent to the Surgeon General that a single course of three months' instruction was out of the question and that the delay in getting officers from this group would seriously inconvenience the Department. Consequently instructions were issued the commandant that the men should be examined for commissions as fast as they completed two months of training, which meant practically a policy of first come first served. The examining board proceeded promptly to work, and as rapidly as the papers were completed they were forwarded to the Surgeon General, who at once submitted recommendations to the Adjutant General for the issue of commissions.

About 170 such recommendations were in the hands of the Adjutant General on November 11 and the papers of more than 200 additional were in process of completion. The signing of the armistice at once terminated the possibility of giving a commission to anyone; in fact, the demobilization of the Army began at once.

The graduates of 1918 served their country as well as any other soldiers. The duties they performed at Camp Greenleaf were in every respect as dignified and important as were those of the men of equal age who did not happen to be veterinary students and who got to France as combatant soldiers. It was not the fault of the 1918 graduates that they failed to obtain commissions. It certainly was not the fault of the Surgeon General's Office, which was most anxious to secure their services as officers. Had the war lasted three

months more, every 1918 graduate who could qualify would have been commissioned and still the demand for officers would not have been satisfied. The fact must not be overlooked, however, that none of these men were entitled *per se* to commissions. They were essentially drafted men with the privileges of enlisted men and no more, and every man who could not qualify for a commission must continue in the service in an enlisted status. There is no question in the minds of those qualified to judge that the service of these veterinarians as enlisted men at Camp Greenleaf furnished the best possible basic training for service later as officers.

The veterinary section of the Medical Officers' Training Camp was in charge of Major W. J. Stokes of the Regular Corps, selected by the Surgeon General for his many excellent qualifications for this work. His assistants were veterinary officers selected and recommended by him. The work performed by Major Stokes and his assistants is believed to have been excellent. The vast amount to be done in a limited time and the shortage of trained assistants tremendously increased his task, and necessarily many details failed to receive the personal attention to which they were entitled and which under less strenuous conditions they would have received.

ORGANIZATION OF CAMP GREENLEAF TRAINING SCHOOL

The following paragraphs describe the organization of the veterinary training center at Camp Greenleaf:

1. ENLISTED SECTION.—The enlisted section of the veterinary training school at Camp Greenleaf, Ga., was organized May 2, 1918. Prior to this date the enlisted men of the Veterinary Corps were messed and quartered with the men enlisted for the Medical Corps. Large groups of new men were constantly arriving in camp, and men who had enlisted for service with the Veterinary Corps were being sent out with men enlisted for the Medical Corps for service in hospitals.

The situation was discussed with the battalion commanding officer, and authority was granted by the camp commanding officer and arrangements were made for the forming of a separate company of enlisted men of the Veterinary Corps.

The company officers were selected from a number of veterinary officers who had just completed their training and who were looked upon as being good material in view of their records as student officers. These officers, Lieutenants Maguire, Jones and Rundle, were assigned to duty with the development battalion with instruc-

tions to observe the men carefully and pick out those best suited for noncommissioned officers. Among those selected for noncommissioned officers there were several who had had previous service in various branches of the military service.

The duties of the officers assigned to the veterinary company were as follows: Lieutenant Maguire, later captain, company commander and directly responsible for the company administration; Lieutenant Jones, later captain, assistant in charge of the stables and instructor in mounted and dismounted drill; Lieutenant Rundle in charge of company mess and property.

Owing to these arrangements, the company was organized without delay and started off very smoothly when the company was called upon to go it alone. When this separation was effected the enlisted personnel consisted largely if not entirely of nongraduates who were to be trained as enlisted veterinary assistants. Later the graduates of 1918 were added to this company for instruction as enlisted veterinary assistants and later as prospective veterinary officers.

Soon after the organization of the veterinary company the stables of the Medical Officers' Training Camp, which were maintained for the purpose of giving riding instruction to the student officers of the M. O. T. C., were turned over to the care of the veterinary company. At the time of transfer there were 309 animals and 225 sets of horse equipment and wagons, all of which were in rather poor condition. This stable was administered by 5 officers of the Medical Department. Later the number of animals was increased to 360 and the equipment to 350 sets.

Among the animals were quite a number with vicious habits such as striking, kicking and biting. It was not at all unusual, prior to the change in administration, to see a student officer kicked out of a stall when approaching to saddle and bridle an animal. One of the first steps taken with a view to preventing injury of the men was to segregate these vicious animals and put a red ribbon in the mane, tail and forelock of those which bit, struck and kicked. Only good horsemen were permitted to handle these animals, which were later disposed of.

With but three officers to supervise such numerous and extensive activities, much of the responsibility rested, through necessity, with the noncommissioned officers. One of the greatest handicaps of the mounted service today is not only the lack of men who have a knowledge of the horse but the lack of men who have even an interest in him. While the acquisition of this stable meant that a

great deal of hard work would have to be done by the enlisted men of the Veterinary Corps, it was regarded as a great asset in that it would afford valuable experience in the care of army animals and equipment and ample opportunity would be afforded for riding instruction. The company was considered to be very fortunate in having among its noncommissioned officers several who had had previous experience in mounted organizations. These men were, in addition, excellent horsemen.

With this in mind, the opportunity to devote considerable time to this kind of work was welcomed, and approximately three hours a day were spent along these lines. The dismounted drill consisted of sanitary and infantry drill, manual of arms (this was discontinued owing to the necessity of turning in the rifles because of lack of storage room and the inability later to acquire them), tent pitching, gas drill, school of the soldier, etc.

Later, when instructions had been received to examine graduates for commissions as veterinary officers, special attention was given to instruction in army paperwork and rendition of reports. Mimeographed copies of letters and the most common and important reports were furnished each man. Books on army paperwork, Manual of Courts Martial, etc., were also furnished for instruction purposes.

Later it was believed that the company was sufficiently well organized and instructed to permit of the appointment of noncommissioned officers from among the enlisted graduates and thus permit the assignment elsewhere of the noncommissioned officers who had been on duty for some time. This step was taken, and these men were sent to Camp Lee, Va., where they joined overseas units and furnished valuable service.

The enlisted men of the company worked very hard. The condition of the stables, corrals and animals was greatly improved. A large new saddleroom and a small corral for animals on sick report were built. The good condition of the stables at all times and their remarkable freedom from flies were frequently commended by those in charge of the School of Sanitation.

The company planned and financed two dances which were for members of the company only and were well attended and apparently popular.

It is felt that many mistakes were made, and such were to be expected in such a large organization with so much to do and with so few officers—each one of whom had to be tried out thoroughly

for some time before making a final selection or rejection—to supervise the doing of it. The conditions were new to all and were frequently very complicated, and evolution was a rather slow process. It is believed that at the time the armistice was signed and the organization disbanded the requirements were quite well understood and all objectionable features were in process of correction or elimination.

2. COMMISSIONED SECTION, OR VETERINARY STUDENT OFFICERS' GROUP.—The student officers' group was formed in February, 1918, for the purpose of giving instruction as to the military duties of veterinary officers and reviewing those professional subjects which the army veterinarian would have to consider, such as sanitation and hygiene; and last but not least, getting into physical condition for field service the man who had spent too many hours each day at a desk or on the soft cushions of an automobile. It should be remembered that primarily the course was one of instruction in the military duties which are required of an officer. All these men were graduate veterinarians and there was neither time nor intent to teach the subjects pertaining to veterinary medicine.

At first the group was in command of a medical officer, and veterinarians were mixed indiscriminately with medical men, dentists, sanitarians and psychologists. Only one veterinary officer was assigned as instructor, and he was able to devote only such time for instruction purposes as was given him. Later, with a great increase in the demand for veterinary officers and the increase in the student group, other veterinary officers were assigned for duty with this group.

Later a veterinary battalion was formed and all the veterinary activities were under the supervision of Major Stokes. In addition to giving professional and military instruction to the student officers, much time had to be spent in conducting professional examinations, not only of the officers but of the graduates in the enlisted section who were ordered to be examined to determine their qualifications as prospective veterinary officers. In addition, veterinary services were required for the handling of an extensive glanders outbreak in Chickamauga Park.

The student officers' battalion was developed, and selected student officers were appointed as permanent company officers who, it was contemplated, would also give mounted instruction to their companies.

The acquisition of the stable company was considered a boon to

the veterinary officers, and two hours three times a week were devoted to riding. Owing to the inability to find suitable officers for instructors, it became necessary, if this important instruction was to be given, to utilize the services of the noncommissioned officers of the enlisted group. While not an ideal condition by any means, it was felt this instruction for officers about to go into active field service was absolutely essential. The value of a veterinary officer is not so much his ability to cure minor or major ailments but rather his ability to prevent them. A thorough knowledge of horsemanship is of great value along these lines. A veterinary officer who is able properly to saddle and ride an animal and give proper instruction in the subject is able to prevent the development of conditions which are responsible for the disability of many animals in the service. Likewise a veterinary officer who has had much experience in riding animals is a better judge of them fit for this purpose than one who has not had this experience.

It was, of course, realized that but little instruction could be given in the short space of time allotted, but it was hoped that the extreme importance of the subject might be impressed on the officers and their interest in it aroused. One of the gretest criticisms of the modern veterinarian called for army service is the lack of knowledge of horsemanship, due largely to the fact that the veterinarian of today makes most of his calls in an automobile and riding and driving are rapidly becoming lost arts.

It was greatly regretted that there was not an abundant supply of veterinary officers for riding instructors. Had the case been different these officers would have been detailed for duty as instructors with the veterinary company which was so short of officers.

HORSESHOEING, MEAT INSPECTION, ETC.

The school at Fort Riley had a capacity for about 350 students. Here men were given desirable courses in horseshoeing, cooking, baking, etc.

A veterinary officer was selected to give instruction in horseshoeing at each of the thirty-five remount depots. A Regular Army veterinary officer with expert knowledge of horseshoeing was detailed to visit the various camps and assist in organizing and equipping horseshoeing schools and give the necessary instruction in this important subject. The school at Fort Riley furnished many of the men who later became instructors in these schools. Major R. J. Foster was the senior veterinary officer at Fort Riley.

There were about 75 veterinary officers and an equal number of enlisted men under Major George A. Lytle on duty with the purchasing officer of the Quartermaster Corps, inspecting meats and meat products purchased for the Army at the various packing centers. In addition there were usually about 50 veterinary officers receiving instruction in army meat inspection. Ample facilities were given these officers to obtain experience and instruction in the work of selecting, inspecting, covering, storing, refrigerating, canning, smoking, curing, shipping, etc. As fast as these men became qualified they were assigned to organizations as meat and dairy inspectors, and new candidates were assigned for instruction. This soon became one of the most important branches of the service.

Much credit should be given the Federal Bureau of Animal Industry for the good work done on antemortem and postmortem inspections and the assistance rendered in meat inspection in general, until our service became organized and equipped to handle the work.

It is a credit to our country to note the enormous amount of meat handled by the Army with little or no complaint in so far as quality and wholesomeness were concerned. Inspections under Major Lytle aggregated from 10,000,000 to 16,000,000 pounds weekly for a long period. Thanks to this work, we had no "embalmed beef" scandal in this war.

LABORATORIES AND SUPPLIES

Veterinary laboratories were established in the early part of 1918 in Philadelphia and at each of the department laboratories of the United States. A veterinary officer with special training in the bacteriology and pathology of animal diseases was assigned to each of these laboratories. Their services proved exceedingly valuable in diagnosing obscure diseases and investigating many remedies recommended for preventing and curing diseases.

The supply division of the Surgeon General's Office labored incessantly with the selecting, standardizing, furnishing and shipping of all veterinary supplies used in the Army. It is true the supplies were inadequate and not obtainable at first. The meager amount of equipment and supplies transferred with the veterinary service by the Quartermaster's Department was practically worthless. The work had to be done from the bottom up by the supply department at a time when the capacity of the manufacturers and transportation companies was already taxed to the limit. It was not long, however, before an adequate supply of medicines, surgical instruments,

dressings and other supplies was available and continued to be provided abundantly till the end of the war.

SUCCESS UNDER DIFFICULTIES

The foregoing outlines the work required in planning and organizing the service. In conjunction with these manifold duties much was done in the way of directing the service in the field. This was no small task. More than 500,000 animals were hurriedly purchased in the first year and a half after war was declared. They were obtained in all parts of the country and a large proportion of them shipped in winter weather of the most extreme type over congested railroad lines for a thousand miles or more to the Atlantic seaboard. The sales stables, stockyards, cars and remount depots were heavily infected with influenza, glanders, lice, gangrenous dermatitis, pododermatitis and other diseases. Most of the remount and embarkation depots were located at points where conditions of climate and soil were decidedly unfavorable to health and comfort. Mud was often knee deep and no shelter or dry place was available for the many sick animals that arrived with the continuous stream of trainload consignments that congested these depots. This disgraceful situation developed as a result of conditions which existed before the veterinary service was organized or equipped, and had been permitted to continue on the plea of military necessity. Only a few veterinarians were stationed at these depots, and they had no available help except an occasional detail of "conscientious objectors" or of men from a labor battalion, detailed by the officer in command of the depot. Most of this class of help were inexperienced in handling horses and lacking in energy or ambition. Nearly every depot could have used to advantage the officers, men and equipment subsequently planned for a hospital of 1,000 animal capacity.

When one realizes the manner in which so many animals were purchased, shipped, stabled and sold during a period of two years, and the possibilities for them to spread disease to other animals in civil life, there appears to be just cause for rejoicing. Glanders was prevalent to some extent, but its spread was checked and the disease eradicated from army animals by the plans adopted by the Surgeon General. We have yet to learn of a case where glanders or other transmissible disease, even influenza, was carried from army animals to those in civil life. This service in controlling glanders was worth all the cost to the Government of the Veterinary

Corps, as without it the disease would have spread to an uncontrollable extent.

COMMISSIONS AND PROMOTIONS

Seventeen veterinarians were commissioned in the grades of captain and major on the recommendation of the Surgeon General for the purpose of securing administrative officers without delay. All the remaining commissions given out (about 2,050) were in the grade of second lieutenant. The promotions of officers in the United States were based on their records and on the recommendations of their superiors. The recommendations of general veterinary inspectors were relied on whenever these could be secured. In December, 1917, written examinations were held and several hundred veterinarians found qualified were promoted as rapidly as vacancies were open. Recommendations for promotion were passed on by a board of three senior veterinary officers on duty in the Surgeon General's Office and by the director of the Veterinary Corps before they were given final approval.

The foregoing applies strictly to the United States. Promotions in the American Expeditionary Forces were placed by the Secretary of War wholly in the hands of General Pershing, and after veterinary officers left the United States there was absolutely nothing to be done in this country to help or hinder their promotions. Their promotion over there depended on their efficiency in the service and the favorable recommendation of their superior officers. Vacancies in the overseas troops in proportion to their strength were of course not filled in this country but were considered as the quota belonging strictly to the Expeditionary Forces.

Time and space will not permit listing the veterinary officers who rendered meritorious services in the work to which they were assigned. Suffice it to say that nearly all veterinarians who were given commissions did their work in a creditable manner. Their work can be regarded with just pride.

VETERINARY SERVICE IN THE A. E. F.

As soon as the plan of organization was finally decided with the probability of its adoption by the War Department, two of our best and most trusted officers were directed to proceed to France and report to the Commanding General, American Expeditionary Forces, for temporary duty and consultation in regard to organizing, equipping and supplying the veterinary department of the Expeditionary Forces. They sailed on November 6, 1917, but due to unfortunate

misunderstandings did not arrive at General Headquarters in France until December 12, 1917. An outline of plans for organizing the veterinary service had been prepared before their departure and was presented to the Chief Surgeon of the Expeditionary Forces. He requested a memorandum on organizing a veterinary service for the Expeditionary Forces and a statement of the veterinary personnel which would be required at different phases of the priority shipment schedule on the basis of the proposed organization. This memorandum was prepared and presented December 27, 1917. The memorandum and statement were promptly submitted to the Chief of Staff and by him referred to the Administration Section. A cablegram having been received advising that Regulation No. 70 had been approved by the Secretary of War, a copy of the regulation was presented with the memorandum and statement. It was returned January 1, 1918, with the statement that the proposed plan of organizing was a very good one but would not fit in with the general plan of organization of the American Expeditionary Forces.

The matter was later taken up with Lieutenant-Colonel James A. Logan, Jr., Chief of the Administration Section, and other officers of the General Staff. After much discussion it was stated that it would be a waste of time to consider the question further, as it had been decided to attach the Veterinary Corps to the Remount Service and this decision was final.

The plan as adopted provided that an officer of the Veterinary Corps should be designated as Chief Veterinarian and assigned to act as assistant to the Chief of the Remount Service, to exercise technical supervision over the Veterinary Service and to draw up regulations and orders and a detailed professional description of all preventive and curative treatments of animal diseases and injuries. The latter was to be printed and distributed to the commanding officers of all branches of army service in which animals are used, for their instruction and guidance. Regulations and orders formulated by the Chief Veterinarian had to be submitted for approval to the Chief of the Remount Service. Many other provisions in this plan were equally unworkable, unreasonable and asinine. During these discussions it was pointed out that mange, glanders and epizootic lymphangitis had already appeared among the animals of the American Expeditionary Forces and that if suitable measures were not immediately instituted these diseases would spread rapidly —a prediction that later proved true.

Almost immediately after Special Regulation No. 70 was pre-

sented to the Chief of Staff an order was issued by Lieutenant-Colonel Logan in the name of the Commander-in-Chief suspending operation of the regulation in so far as it applied to the American Expeditionary Forces.

On February 22, 1918, the Chief Surgeon sent a communication to the Chief of Staff stating that from all that had been said, written and cabled during the previous months he gathered that so far as the veterinary service was concerned it was to be the duty of the Medical Department to furnish veterinary personnel and supplies for the American Expeditionary Forces and that the remainder of the veterinary service would be handled by the Remount Service. In reply it was stated that the order on the organization of the Remount Service, then in preparation, would make the Veterinary Service a part of the Remount Service under the Chief Quartermaster; the Chief Surgeon, after supplying needed veterinary personnel to the medical supply depots, was to report other veterinary personnel to headquarters for assignment by the Chief Quartermaster, and that supplies were to be furnished by the Medical Department. This meant that the administration of the Veterinary Service, except in reference to supplies, was to be taken away from the Surgeon General, although it was placed under his direction by the Act of June 3, 1916, and that the regulations approved by the Secretary of War were to be set aside.

There appeared to be nothing further for our representatives to do in the way of consultation in regard to the organization, equipment and supply of the Veterinary Service of the American Expeditionary Forces, consequently they left General Headquarters for return to their stations in Washington on March 10, 1918, with the proposed order for the organization of the Veterinary Service in course of preparation in Colonel Logan's office.

To say that we were disappointed with the results of this well-planned, properly executed effort to introduce our form of organization overseas would be putting the question mildly. It was soon decided to proceed with work as outlined in this country and await future developments. If the two services could have been correlated into one, the work here would have been much easier and more readily and effectively utilized overseas.

It was not long before a request was received from overseas for another veterinary officer from the headquarters office. Our hope of placing the plan of organization on a working basis was again aroused. The one sent this time was among the first who was called

by the Surgeon General in the early part of the war. He responded to the second call as promptly as he had to the first. The results of his efforts overseas can best be judged by a paper which will follow.

THE FUTURE UNCERTAIN

It is the general belief that the plan promulgated in America for handling the veterinary service in war was satisfactory, efficient and workable. The Surgeon General's Office has no excuses to make for it. Nothing better was suggested or available under the conditions. There were many ways in which it could have been improved. Most of these possibilities were blocked by the want of suitable legislation or permission from higher authority.

It should be understood that the plans and organization under which the Veterinary Corps operated were possible only as a war measure and authority for the existence of the corps will be terminated by the provisions of the Overman Act as soon as the emergency for which it was created is over. The future destiny of the corps will depend greatly upon legislation now pending. There is no authority or assurance that the veterinary directorate will be continued and the army veterinary service may drop back into the old condition of affairs that existed before the war, unless prompt measures are provided to prevent it. The Surgeon General stands ready to do all in his power to make it attractive for veterinarians and a useful factor in the Army. The time appears ripe for united intelligent action. The need for veterinary service in the Army has been demonstrated beyond a doubt. The recent experience has imbued those who participated with the wonderful possibilities for good there is in an army veterinary service authorized, organized, equipped and ready to be sufficiently expanded on short notice to meet any emergency that may arise. Each of the more than 2,000 veterinarians who saw service in this war, every member of this Association, and all who are interested in the welfare of animals and animal husbandry in general, should do his utmost to place this important branch of our profession on an efficient and substantial basis.

Our Association can assist by a persistent, continued effort for a higher standard of efficiency among veterinary schools and veterinarians in general. If this service is to continue as a part of the Medical Department, veterinarians must be equally as well qualified mentally, physically, morally and intellectually as men in the Medical or Dental Corps. There is great need for enthusiastic interest

in the Army Veterinary Corps on the part of civilians. We should give it our most loyal support on every occasion, make a determined effort to interest promising young men to enter the service and support the Corps to the fullest extent of our ability in its various troubles. We should be "boosters" and not "kickers" and should waste no time in quibbling over the mistakes and imperfections of the past.

A recent visit to Rock Creek Cemetery, Washington, D. C., during the Yuletide season showed that some interested friend was keeping memories green by placing floral tributes on the near-by graves of Drs. D. E. Salmon, A. D. Melvin and Charles M. Mansfield, the latter a young veterinarian of sterling quality and great promise when stricken at the very beginning of his career in the Biochemic Division of the Bureau of Animal Industry.

Captain R. Daubney of the British Board of Agriculture and Fisheries, following active service in the British Army since August, 1914, has been detailed to the United States for a period of about a year, to make a study of the subject of parasitology and will carry on the major portion of his investigations in the laboratories of the Zoological Division, Bureau of Animal Industry, Washington, D. C.

Dr. O. A. Longley of California has just returned from an extensive and successful tour of Australia and New Zealand in the interest of the Lederle Antitoxin Laboratories. From his reports he must have had a very interesting and enjoyable trip meeting most of the prominent veterinarians and live stock sanitarians of those countries.

Drs. Humphries and Robbins of the Southern Railway service were recent visitors to Washington in connection with the heavy losses among mules shipped over their lines.

Dr. M. H. Dollar, formerly engaged in Hog Cholera Control work for the B. A. I., has resigned and is now practicing at Danville, Ky., with Dr. Chas. W. Fisher.

BACTERIOLOGIC STUDIES OF A PERACUTE DISEASE OF HORSES AND MULES

By ROBERT GRAHAM, *Captain, V. C.;* FRANCOIS H. K. REYNOLDS, *First Lieutenant, V. C., and* DR. J. F. HILL, *Contract Surgeon, U. S. Army*

(*Continued from the January number*)

ANIMAL TRANSMISSION EXPERIMENTS

THE pathogenic character of the organism was determined by feeding the cultures to horses and mules, and to small animals, as well as by intravenous, intraperitoneal and subcutaneous inoculations.

LARGE ANIMAL EXPERIMENTS

MULE TRANSMISSION EXPERIMENT NO. 1.—Two mules were fasted for 52 hours to induce fatigue simulating the condition of lowered vitality incident to journey by rail. The animals were then allowed food and water ad libitum as a practice employed in transit at railway unloading and feeding stations. In the feed of Mule B 100 c.c. of a broth culture of Gartner's bacillus were disguised. Mule A was allowed similar portions of food, uncontaminated. Both animals ate heartily after the fasting period. The following day Mule B was clinically afflicted. The symptoms displayed were regarded by experienced observers as typical of the natural disease, i. e., extreme depression, cardiac weakness, loss of appetite, cyanosis of the mucous membranes, etc. Forty-two hours later death occurred. Gross anatomical alterations observed were not marked nor of a character sufficient to explain death, which was characteristic of the peracute disease occurring naturally. From the spleen of Mule B the organism fed was regained without difficulty. Mule A remained healthy. (See Table 4.)

MULE TRANSMISSION EXPERIMENT NO. 2.—Three healthy mules, designated C, D and E, were fasted 36 hours, at the end of which time water and feed were allowed ad libitum. In the feed of Mule C 50 c.c. of a 48-hour broth culture of Gartner's bacillus recovered from Mule B of the preceding experiment was employed. A like amount of a similar culture heated at 80° F. for 20 minutes was fed to Mule D, and 50 c.c. of sterile filtrate of a 48-hour broth culture was placed on the feed of Mule E. The latter two preparations were tested for sterility. During the administration of this

TABLE 4—MULE TRANSMISSION EXPERIMENT NO. 1.

ANIMAL	DECEMBER 20, 1918	DECEMBER 21, 1918	DECEMBER 22, 1918	DECEMBER 23, 1918
Mule A	Temperature: 8:00 a. m., 4:00 p. m., 99.0	Rice meal and hay ad libitum at 2:00 P. M. Temperature: 8:00 a. m., 97.4 4:00 p. m.	Normal Temperature: 8:00 a. m., 101.1 4:00 p. m., 101.6	Normal Released from test Dec. 30. Temperature: 8:00 a. m., 100.4 4:00 p. m.
Mule B	Temperature: 8:00 a. m. 4:00 p. m., 97.8	2:00 p. m., 100 c.c. broth culture Gartner's bacillus on feed. Temperature: 8:00 a. m., 98.4 4:00 p. m., 99.0	Dejected appearance; no appetite; rapid breathing; congestion m. m. of mouth; restive attitude: stands drooping, sleepy appearance. Temperature: 8:00 a. m., 103.4 4:00 p. m., 103.0	Died at 8:00 a. m. Autopsy; lining small intestines mildly congested; fracture of rib incurred through violence during illness. Organism recovered from spleen.

material in feed, Mule E, which consumed the filtrate, was permitted through error to ingest a portion of the feed containing the virulent culture prepared for Mule C. Three days later Mule E succumbed. It was noted the preceding day that this animal was very sluggish and depressed, yet the rapid termination was not anticipated. The autopsy on this animal was delayed until postmortem changes masked any gross lesions that might have accompanied death. The organism fed was regained from the stomach, cecum and kidneys. Mule C survived approximately 48 hours longer, but typical symptoms of the sporadic disease were noticeable for two days preceding death. Diarrhea was very marked and upon postmortem the cecum and colon were found to be involved, as described under gross pathology of the disease. Mule D showed no visible symptoms of illness following the ingestion of the killed culture. (See Table 5.)

MULE TRANSMISSION EXPERIMENT No. 3.—The pathogenicity of Gartner's bacillus by intravenous and subcutaneous modes of infection was tested on two healthy, unfatigued mules, designated F and G. The former received 2 c.c. of a 24-hour surface growth upon agar, suspended in saline solution. A thermal reaction followed, accompanied by transitory symptoms of depression. The animal was inactive for several days but recovered completely. Following the subcutaneous injection of 3 c.c. of a similar suspension into Mule G a slight rise in temperature (102.8) was noted on the succeeding day. The appetite continued normal, but at the point of inoculation a large, indurated, sensitive swelling developed, 18 by 3 cm., which persisted for several days and was noticeable at the end of three weeks. Complete absorption was preceded by a small area of pus formation at the point of inoculation, though the animal continued apparently healthy.

As a result of intravenous and subcutaneous inoculations it is thought that Gartner's bacillus does not multiply in the blood stream to result in general invasion of a healthy horse. It is presumed that the natural mode of infection is probably of intestinal origin and that the growth and multiplication probably occurs under certain conditions in the intestinal tract with the elaboration of poisonous substances which gain entrance to the circulation. A primary intoxication rather than a bacteriemic invasion is thus suggested. This contention is further suggested from culturing the blood of naturally and artificially infected animals during the course of the disease. In many instances 5 to 10 c.c. of blood was drawn aseptically from naturally afflicted animals into 50 c.c. of dextrose broth, which

TABLE 5.—MULE TRANSMISSION EXPERIMENT No. 2
Animals fasted for 36 hours before feeding.

ANIMAL	JANUARY 2, 1919	JANUARY 3, 1919	JANUARY 4, 1919	JANUARY 5, 1919	JANUARY 6, 1919	JANUARY 7, 1919	JANUARY 8, 1919
Mule C	2:00 p. m., 50 c.c. broth culture, 48 hours, Gärtner's bacillus. Temperature: 8:00 a. m. 4:00 p. m., 98.2	Apparently normal. Temperature: 8:00 a. m., 102.4 4:00 p. m., 102.5	Loss of appetite; dull. Temperature: 8:00 a. m., 99.0 4:00 p. m., 100.	Loss of appetite; dull. Temperature: 8:00 a. m., 99.0 4:00 p. m., 101.4	Loss of appetite, dull; diarrhea. Temperature: 8:00 a. m., 98.4 4:00 p. m., 99.0	Loss of appetite; dull; diarrhea. Temperature: 8:00 a. m., 101.0 4:00 p. m., 101.1	Died at 7:00 a. m.
Mule D	2:00 p. m., 50 c.c. broth culture, 48 hrs, Gärtner's bacillus heated 20 min. at 80 C. Temperature: 8:00 a. m. 4:00 p. m., 98.7	Normal. Temperature: 8:00 a. m., 98. 4:00 p. m., 99.	Normal. Temperature: 8:00 a. m., 100. 4:00 p. m., 100.	Normal. Temperature: 8:00 a. m., 100. 4:00 p. m., 99.	Normal. Temperature: 8:00 a. m., 98.6 4:00 p. m., 100.	Normal. Temperature: 8:00 a. m., 99.5 4:00 p. m., 99.	Normal. Temperature: 8:00 a. m., 100.4 4:00 p. m., 100.
Mule E	2:00 p. m., 50 c.c. broth culture, 48 hours, filtered through Berkefeld filter. Temperature: 8:00 a. m. 4:00 p. m., 100.6	Apparently normal. Temperature: 8:00 a. m., 99. 4:00 p. m., 99.	Loss of appetite. Temperature: 8:00 a. m., 100. 4:00 p. m., 100.	Loss of appetite and diarrhea. Temperature: 8:00 a. m., 100. 4:00 p. m., 101.6	Died.		

The value of this experiment in establishing the toxicity of the filtrate is disregarded, as Mule E consumed a portion of Mule C's feed.

remained sterile after incubating for a period of 10 days at 37.5° C.

MULE TRANSMISSION EXPERIMENT No. 4.—It would appear from the following that intravenous injection and oral administration of Gartner's bacillus do not produce fatal results in healthy *unfatigued* animals. This conclusion is based upon the result of an experiment wherein a healthy mule designated H received c.c. of a 24-hour agar surface growth of strain 104-B suspended in sterile salt solution. There was a slight thermal reaction (102.1° F.) on the afternoon of the third day. Following the intravenous injection an allergic-like reaction occurred. Respirations were increased, defecation was labored and intermittent, with a staggering gait and general fatigue. The following day the symptoms were not so marked, and on the third day food and water were consumed. The animal returned to normal and continued apparently healthy. Release followed 10 days later.

Mule I received 100 c.c. of a broth culture of the same strain per os as a drench. The following day the animal appeared dull and depressed with loss of appetite. There was no increase in temperature. On the third day a "tucked up" or gaunted appearance was noted. On the fourth day the animal showed slight improvement and partook of a small quantity of food, followed by improvement each day until released from the test 10 days later.

It is apparent that the organism as administered to the animals H and I had only a transitory effect following intravenous injection, contributing to the contention that it induces a toxemia rather than a bacteriemia. In the case of Mule I 100 c.c. of the organism as a drench did not produce the clinical disease under observation, suggesting that a susceptible host must be subjected to conditions similar to those occurring incident to shipping; that is, fatigue, fasting, etc., in order to create the conditions under which invasion of the animal naturally occurs.

TRANSMISSION EXPERIMENT No. 5.—At the time this experiment was undertaken little was known as to the real identity of the organism under investigation, but it was desired to ascertain, if possible, the following facts:

1. Whether a bouillon filtrate of the original strain 104-B which proved virulent for mules (and which had been growing for three months) would produce death, as well as to determine whether or not vaccination, as in the case of Mule H which had received 4 c.c. of an agar culture intravenously and had been fed 100 c.c. of a bouillon culture of strain 104-B, and Mule I which was inoculated

per os on two occasions with 100 c.c. of the same strain, would produce an active immunity of sufficient strength to protect these animals against 100 c.c. of a broth culture of 104-B administered per os.

2. Whether 100 c.c. of antiserum (?) obtained from Mule G, which had been inoculated several times subcutaneously with this same organism, and which demonstrated the presence of complement-fixing and agglutinating bodies, would likewise prove of value as a protective agent.

3. Whether a broth culture of strain 141, recovered from the axillary vein of a spontaneous case and which appeared serologically to be the same organism, would produce death.

4. Whether *Bacillus coli communis*, usually encountered in the intestinal contents of horses, had any bearing on the malady.

5. Whether 100 c.c. of a broth culture of 104-B, heated at 60° C. for one-half hour, would demonstrate toxicity.

6. Whether two organisms, strain H-31 (or QMC) obtained from feces in the Quartermaster's Stables at Fort McPherson and passed through a guinea pig, and strain Mule 11, obtained from a rectal culture of a spontaneous case, both resembling the organism being investigated, would also prove virulent.

Mule R served as a control and received 100 c.c. of strain 104-B.

Details of this experiment are given in Table 6.

As will be seen from Table 6, all animals remained alive except Horse P, which received 100 c.c. of a broth culture of strain H-31 (QMC), which had been isolated from the Quartermaster's Stables. This animal showed well-marked symptoms of the disease 24 hours after inoculation, including cyanosis of the mucous membranes, profuse ill-smelling diarrhea, imperceptible pulse, general weakness and inappetence, elevated temperature (103-105), and death at about the forty-eighth hour. Postmortem examination revealed little, due, undoubtedly, to the acute character of the disease. However, there was a slight hyperemia of the mucous membrane of the fundus portion of the stomach, which may or may not have been significant, and a few punctiform hemorrhages beneath the capsule of the spleen. The organism was recovered from the spleen.

From a general survey of the results it would appear that culture 104-B, which had been growing since November 30, 1918, and was, at the time of feeding, nearly 3 months old, had lost in virulence to such a degree that it was unable to produce the disease, for the control animal R, which had received nothing of a protective nature,

TABLE 6.—FEEDING EXPERIMENT No. 5.

All animals fasted 48 hours before feeding. Inoculated 11:00 a. m., February 21, 1919.

ANIMAL	MATERIAL		AMOUNT	METHOD	RESULTS
	CULTURE	AGE			
			c.c.		
Mule H	Broth culture Gärtner's bacillus 104-B	Nov. 30, 1918	100	Fed	Apparently normal after 11 days.
Mule I	Broth culture Gärtner's bacillus 104-B	Nov. 30, 1918	100	Fed	Apparently normal after 11 days.
Mule K	Serum from Mule 1	Nov. 30, 1918	100	Intravenous	Apparently normal after 11 days.
	Broth culture Gärtner 104-B		100	Fed	
Mule L	Broth culture (axillary vein 141)	Feb. 14, 1919	100	Fed	Apparently normal after 11 days.
Mule M	Broth culture *B. coli communis*	Feb. 9, 1919	100	Fed	Apparently normal after 11 days.
Horse N	Broth culture Gärtner 104-B heated 60° C. half hour.	Nov. 30, 1918	100	Fed	Apparently normal after 11 days.
Horse P	Broth culture Gärtner QMC (H-31).	Feb. 14, 1919	100	Fed	Died 33 hours subsequent to feeding.[1]
Horse Q	Broth culture Gärtner, Mule 11.	Feb. 14, 1919	100	Fed	Apparently normal after 11 days.
Mule R	Broth culture (control for strain 104-B).	Nov. 30, 1918	100	Fed	Apparently normal after 11 days.
Horse O	Filtrate Gärtner 104-B, filtered through Berkefeld.	Nov. 30, 1918	100	Fed	Apparently normal after 11 days

[1]Temperature normal on 21st (day of feeding); February 22, 8:00 a. m., 103; 3:00 p. m., 105. Pulse imperceptible; marked weakness; foul-smelling diarrhea; marked cyanosis of mucous membrane of mouth. Postmortem: Fundus portion of stomach slightly inflamed; punctiform hemorrhages in spleen; other organs apparently normal. Organism recovered from spleen.

remained apparently normal throughout the test. This also would appear to apply to the filtrate and heated culture of the same organism, all material of strain 104-B having been used from the same flask.

Further, it would appear that *B. coli communis* had no primary significance, though it may contribute to the disease in the role of a secondary invader. The strains 141 (from the axillary vein) and Mule 11, both from spontaneous cases, but which had not been passed through small animals, and which had been carried on artificial medium, also lacked in virulence and were unable to produce perceptible changes.

The absence of death in the control animal rather hampers deductions. It is important, however, that Gartner's bacillus, strain H-31, isolated from the intestinal tract of healthy animal at Quartermaster Stable at Fort McPherson, Ga., proved fatal to experimental Horse P following fatigue. The result in this instance strongly suggests the saprophytic existence of this organism which may play a pathologic and even fatal role in carrier animals subsequent to exhaustion. It has been noted elsewhere in this report that the spontaneous disease developed only subsequent to shipment, and it is obvious that the lowered vitality or exhaustion of the animal is fundamental in the spontaneous occurrence of Gartner infection in equines.

EXPERIMENT 5-A.—In view of the fact that strain H-31 (QMC) had proved quite virulent, and being apparently the same organism as strain 104-B, it was decided to vaccinate certain of the animals remaining from Experiment 5 and to feed strain H-31 (QMC) in a further endeavor to ascertain the protective value of inoculations.

On March 4, 1919, Mule L was inoculated intravenously with 4 c.c. of a broth culture of H-31, heated at 60° C. for one-half hour, while Horse N received 8 c.c. subcutaneously. While the latter showed no change in attitude, the former after 45 minutes showed signs of depression and weakness, general muscular tremor, accelerated respiration, yawning, and a desire to lie down. The condition persisted for about one hour, after which the animal returned to an apparently normal condition. (On this date it was determined that the organism under experiment was *B. enteritidis*.)

The apparent toxicity of the killed culture prompted the inoculation, on March 7, 1919, of Horse Q, intravenously, with 4 c.c. of a germ-free filtrate of the H-31 strain, unheated. Horse O, serving as a control, received by the same method 6 c.c. of an incubated *uninoculated* quantity of bouillon which also was filtered through a

TABLE 7—SEROLOGICAL TESTS.

Tests of March 1, 1919, About Nine Days Subsequent to Experiment 5, to Determine Presence of Immune Bodies.

	COMPLEMENT-FIXATION			AGGLUTINATION	
SERUM	ANTIGEN USED	TITRE	STRAINS FED	ANTIGEN USED	TITRE
Mule H	Gärtner 104-B	4+	Gärtner 104-B	Gärtner 104-B	1-200
Mule I	Gärtner 104-B	1+	Gärtner 104-B	Gärtner 104-B	1-100
Mule K	Gärtner 104-B	1+	Gärtner 104-B	Gärtner 104-B	Neg.
Mule L	Gärtner 104-B	—	Gärtner axillary vein 141	Gärtner 141	Neg.
Mule M	Gärtner 104-B	—	Coli communis	Coli communis	Neg.
Horse N	Gärtner 104-B	—	Gärtner 104-B	Gärtner 104-B	Neg.
Horse O	Gärtner 104-B	—	Filtrate 104-B	Gärtner 104-B	Neg.
Horse Q	Gärtner 104-B	—	Gärtner Mule 11	Gärtner Mule 11	Neg.
Mule R	Gärtner 104-B	—	Gärtner 104-B	Gärtner 104-B	Neg.
Tests of March 11, to Determine Presence of Immune Bodies Prior to Feeding Experiment 6.					
Mule H	Gärtner QMC	4+			
Mule I	Gärtner QMC	1+			
Mule K	Gärtner QMC	2+			
Mule L	Gärtner QMC	4+			
Mule M	Gärtner QMC	—			
Horse N	Gärtner QMC	—			
Horse O	Gärtner QMC	—			
Horse Q	Gärtner QMC	—			
Mule R	Gärtner QMC	—			
Tests of March 27, Thirteen Days Subsequent to Feeding Experiment 6.					
Mule H	Gärtner QMC	3+		Gärtner QMC	1-200
Mule I	Gärtner QMC	1+		Gärtner QMC	1-100
Mule K	Gärtner QMC	1+		Gärtner QMC	Neg.
Mule L	Gärtner QMC	1+		Gärtner QMC	1-200
Mule M	Gärtner QMC	1+		Gärtner QMC	1-200
Horse N	Gärtner QMC	—		Gärtner QMC	1-100
Horse O	Gärtner QMC	—		Gärtner QMC	1-100
Horse Q	Gärtner QMC	—		Gärtner QMC	Neg.
Mule R	Gärtner QMC	—		Gärtner QMC	Neg.

Those animals (H, I, K and L) which had been inoculated subcutaneously and intravenously gave signs of the presence of immune bodies, while those which had been fed persistently with large quantities failed to demonstrate such signs.

Berkefeld and not subjected to heating. Both animals prior to inoculation showed unusual liveliness, necessitating restraint.

Twenty-five minutes after the inoculations Horse Q, which had been playfully biting the control animal O, stopped suddenly, registering an expression of surprise, and walked away shaking his head. The following actions, which persisted at the end of one hour, were noted: Marked signs of uneasiness, head lowered and raised alternately, extending and flexing of legs, pawing, yawning, attempts to lie down but seeming to change his mind on each occasion, extending the legs far in front and back, not unlike a dog in the act of stretching, marked general muscular tremor, weakness in hind legs, defecation, refusal of food (though a greedy eater), and drawing up flanks as if endeavoring to evacuate bowels (an action also noticed in rats after an intraperitoneal inoculation). Pulse beat was slow though strong; little change in respiration; temperature 100.2;

mucous membranes showed nothing important. Finally the horse lay down for about 15 minutes, after which it got up and partook of a little hay. Muscular tremor, though not so pronounced, and an attitude of apprehension persisted for more than an hour. Subsequent temperatures proved normal.

Horse O showed no change.

Blood samples from those animals constituting Experiment 5 were tested 10 days later for both complement-fixing and agglutinating bodies, with the results noted in Table 7.

Attention is invited to the fact that animals H and I, which received injections of the material, and Mule K, which received immune (?) serum from Mule I, gave some reaction to the complement-fixation and agglutination tests, while animals more recently fed the culture failed to show the presence of immune bodies.

EXPERIMENT NO. 6.—In view of the fact that the animals in Experiment 5, which received the broth cultures of 104-B in the feed, showed no signs of uneasiness nor the slightest indication of illness, and the further fact that this culture had been growing nearly 3 months, it was thought that the material had decreased in virulence to such a degree as to be unable to produce the disease, though subcultures showed it to contain live organisms. Therefore it was decided to feed again the animals remaining from Experiment 5, but this time employing a culture of H-31 (QMC), the strain which had proved so virulent in the case of Horse P and which proved to be a Gartner bacillus.

Blood serum from these animals was tested serologically by both the agglutination and complement-fixation tests, using homologous antigens (for they all did not receive the same organisms) as well as an antigen made from H-31, the strain to be used at this time. The results of the serological tests may be seen in Table 7. There appeared to be no immune bodies except in the cases of those which had received previous subcutaneous or intravenous inoculations of Gartner's bacillus.

On March 12, 1919, the experiment was commenced with fasting the animals for 48 hours, at the end of which time (March 14) each was fed with 100 c.c. of a serum-broth culture of strain H-31, as indicated in Table 8, with the exceptions of Horse O, which received a germ-free filtrate of the same culture, and Horse Q, which received the same amount of a broth culture which had been heated to 60° C. for one-half hour.

The following morning the animals showed a slight rise in tem-

perature, dejected appearance, and refused their morning meal, which, however, they consumed in small quantities during the forenoon. There was an improvement by night, and all appeared normal on the third day after the inoculation.

While it would appear strange that some of these animals did not succumb to the malady after having been fed an organism which had proved of high virulence a few days previously, it may have been that they were rendered more or less immune, not only by the several subcutaneous and intravenous inoculations of some, but also by the feeding of the culture 104-B in Experiment 5, which, while not proving sufficiently virulent to produce death, may have stimulated an immunity or intestinal tolerance sufficiently strong to combat the subsequent feeding of the virulent culture of H-31. Quoting from Park and Williams,[7] that "feeding *does* produce immunity in experimental animals," it is thought that this theory deserves consideration.

FEEDING EXPERIMENT No. 7.—In this experiment three freshly prepared serum-bouillon cultures of Gartner's bacillus, strains No. 1, 104-B, and QMC (or H-31), were fed to ascertain if they would also prove capricious in toxicity, and to study further the serological phase; also to ascertain whether *B. paratyphoid B*, so like Gartner's bacillus culturally, and *B. paracolon*, which seemed similar serologically, would also produce the clinical picture of the spontaneous disease under consideration; and further, to determine whether the intravenous inoculation of Mule L with 4 c.c. of the strain H-31 (QMC) on February 21 and a feeding of 100 c.c. of the same strain March 14, 1919, and the unsuccessful feeding of Mule M with 100 c.c. of a culture of H-31 on March 14, 1919, would render them both immune to subsequent feeding of virulent organisms.

From a perusal of Table 9 it will be seen that the three strains of *B. enteritidis* (Gartner) did prove virulent in the cases of S, T and U, and these animals displayed the identical clinical picture viewed in spontaneous cases, i. e., depression, pendulous lower lip, cyanotic mucous membranes, profuse ill-smelling diarrhea, elevated temperatures, and finally exhaustion and death.

Mule X, which received a culture of *B. paratyphoid B*, succumbed the day following feeding and presented the typical picture of the affliction being studied.

Mule V, which received the Army Medical School strain of *B. paracolon*, failed to succumb or show uneasiness, whereas Horse W, which was fed the Parke-Davis strain of the same organism, showed

TABLE 8.—FEEDING EXPERIMENT No. 6.
Animals fasted 48 hours beginning March 12, 1919; fed cultures March 14.

ANIMAL	MATERIAL		QUANTITY	METHOD	RESULTS
	CULTURE	AGE			
			c. c.		
Mule H	Broth culture Gärtner H-31.	48 hours	100	Fed	Normal.
Mule I	Broth culture Gärtner H-31.	48 hours	100	Fed	Normal.
Mule K	Serum from Mule H.		100	Intravenous	Normal.
	Broth culture Gärtner H-31.	48 hours	100	Fed	
Mule L	Vaccinated with culture H-31 (60° C., half hour)[1].	48 hours	4	Intravenous	Normal.
	Broth culture Gärtner H-31.	48 hours	100	Fed	
Mule M	Broth culture Gärtner H-31.	48 hours	100	Fed	Normal.
Horse N	Vaccinated with culture H-31 (60° C., half hour)[1].	48 hours	4	Subcutaneous	Normal.
	Broth culture H-31.	48 hours	100	Fed	
Horse O	Bouillon filtrate (plain) control on Q[2].	48 hours	6	Intravenous	Normal.
	Bouillon filtrate H-31 (Berkefeld).	48 hours	100	Fed	
Horse Q	Bouillon filtrate H-31 (Berkefeld).	48 hours	4	Intravenous	Normal.
	Broth culture H-31 heated to 60 C., half hour.	48 hours	100	Fed	
Mule R	Broth culture Gärtner H-31.	48 hours	100	Fed	Normal.

[1]Mule L after vaccination showed general muscular tremor, yawning, restlessness, frequently lying down, stretching, defecation. Horse N, the control, remained normal. These animals were vaccinated March 4.
[2]Inoculated March 7 (see Experiment 5-A).

depression, weakness, and a diarrhea, which persisted for 4 days, when the animal became moribund, dying on the fifth day after feeding. This animal did not demonstrate any symptoms other than listlessness, elevated temperature, diarrhea and loss of appetite. The mucous membranes remained unchanged in contradistinction to the others receiving Gartner's bacillus. This animal on postmortem showed a well-marked enteritis, due undoubtedly to the length of time it was afflicted.

Postmortem on animals which had suffered acutely failed to produce anatomical alterations other than a slight inflammation of the small intestines.

Horse Y, which received a larger quantity of *B. coli communis* (as this organism was ever present in spontaneous cases), showed nothing other than a rise in temperature on the third day.

Mules L and M, which had been treated previously with *B. enteritidis* (Gartner), seemed to display a well-marked immunity, evidenced by the fact that they received like amounts of the same organism fed others of this test which succumbed. Their serum titered but 1-50 and 1-66.

Despite careful technic, the organism could not be recovered from Horse U, which had received the QMC strain of Gartner's bacillus. Cultures were made from all organs and heart blood.

The organisms fed were recovered from other cases which succumbed.

SMALL ANIMAL INOCULATION EXPERIMENTS

Three guinea pigs, three rats, and three mice were injected intraperitoneally and subcutaneously with surface growths of Gartner's bacillus in normal salt solution. The amounts injected varied in different animals, from 0.2 to 0.05 c.c., as shown in Table 10. Mice proved more susceptible than did rats or guinea pigs and were more acutely afflicted, death following in from 2 to 4 days. Rats and guinea pigs succumbed after a varying period of incubation. Only those animals succumbing in a short time yielded positive cultures from their several organs.

The toxin alone was found pathogenic for mice when inoculated in small doses.

RABBIT INOCULATION EXPERIMENT, December 2, 1918.—Nine rabbits varying in weight from 963 to 1868 grams were injected subcutaneously, intraperitoneally and intravenously with varying

TABLE 9.—FEEDING EXPERIMENT No. 7.
Animals fasted beginning May 19, 1919, fed May 21, 1919.

ANIMAL	MATERIAL FED	AMT.	TEMPERATURES													
			20		21		23		23		24		25		26	
			a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.
Horse S	Gärtner No. 1	c.c. 100	100.	99.8	99.6	100.	105.	Dead								
Mule T	Gärtner 104-B	100	99.2	99.6	99.4	99.8	103.2	Dead								
Horse U	Gärtner QMC	100	99.6	99.4	99.2	99.8	104.8	105.	104.	104.4	106.4	Dead				
Mule V	Paracolon, Army Med. School	100	100.4	100.	100.	100.6	100.4	102.	102.2	100.	101.1	101.	100.	101.	99.	
Horse W	Paracolon, Parke-Davis	100	101.2	100.8	100.	100.4	103.	106.	104.2	105.6	104.	104.2	105.	105.	103.	Dead
Mule X	Paratyphoid B	100	99.4	99.8	99.6	100.	103.4	Dead								
Horse Y	Coli communis	150	98.2	99.	98.8	99.6	102.	103.	100.2							
Mule M Control	Gärtner No. 1	100	99.	99.4	98.8	99.6	102.2	103.4	102.							
Mule L Control	Gärtner QMC	100	98.8	99.	98.6	99.4	100.	100.2	101.							

amounts of the surface growth in sterile normal salt solution of strain 104-B. Death followed, with one exception, in 2 to 14 days. It is noted that the intravenous injection into rabbits proved more rapidly fatal than did the intraperitoneal or subcutaneous injections, and in subsequent inoculations of small animals a variability of susceptibility was noted. A fatal injection for one animal proved harmless to another. (See Table 11.)

GUINEA-PIG FEEDING EXPERIMENT, April 17, 1919.—From the following feeding experiment it may be seen that susceptible animals may be killed by feeding Gartner's bacillus and allied organisms, but that the organisms may not be recovered in every instance. Two of the animals receiving cultures of *B. enteritidis* failed to succumb, demonstrating the variability either in toxicity of the organism or in resistance of the individual. These same organisms were virulent when inoculated intraperitoneally into guinea pigs. It further demonstrates the fact that, in peracute cases, the postmortem findings are practically nil, a condition so frequently met with in horses.

In no case of this experiment were the several organisms recovered. It might be said that the disease, in these instances, was too

TABLE 9.—FEEDING EXPERIMENT No. 7.—Continued.
Animals fasted beginning May 19, 1919, fed May, 21 1919.

ANIMAL	SEROLOGICAL TESTS				REMARKS
	BEFORE		AFTER		
	Comp. Fix.	Agglutination	Comp. Fix.	Agglutination	
Horse S	Negative	Negative at 1-50	Negative	Positive at 1-50, Negative at 1-66	May 22, 10:00 a. m., down; imperceptible pulse; mucous membrane cyanotic; 11:00 a. m., dead.
Mule T	Negative	Negative at 1-50	Negative	Negative at 1-50	May 22, 10:00 a. m., same as above; May 22, 12:00 a. m., dead; clinical picture same as above.
Horse U	Negative	Negative at 1-50	Negative	Negative at 1-50	May 22, sick; May 23, sick; May 24, clinical picture above; dead.
Mule V	Negative	+— 1-50	1+	Positive at 1-100	May 22, a little indifferent; May 23, normal; May 27, released from test.
Horse W	Negative	Positive 1-50	Negative	Negative at 1-50	May 22, 10:00 a. m., sick; May 26, moribund; weak; loss of appetite, but mucous membrane not cyanotic; died.
Mule X	1+	Positive 1-50	2+	Negative 1-50	May 22, sick, 2:00 p. m., respiration 40; cyanotic mucous membrane; same picture as in Gärtner infection; dead.
Horse Y	Negative	Negative 1-50	Negative	Negative 1-50	May 22, apparently normal; May 27; released from test.
Mule M Control	Negative	+— 1-50	Negative	+— 1-50	May 22, signs of indifference; May 24, apparently normal; May 27, released from test.
Mule L Control	Negative	+— 1-50	Negative	Positive 1-66	May 22, apparently normal; May 27, released from test.

acute, but, conversely, Horse P of Experiment 5 died in 33 hours after feeding and the organism was recovered from the spleen. Further, the blood serum of those two animals which remained alive demonstrated *no agglutinins* for *B. enteritidis* (Gartner). (See Table 12.)

GUINEA-PIG FEEDING EXPERIMENT, April 28, 1919.—Again, the variability of toxicity and individual susceptibility is shown by an experiment in which six guinea pigs were fed varying amounts of pooled bouillon cultures of different strains of *B. enteritidis* (Gartner). It will be seen from Table 13 that but three of this number died and cultures from the various organs in two instances failed to demonstrate the organisms artificially administered in the feed. Postmortem examination revealed no anatomical changes. Animals Nos. 1, 2 and 6 were apparently healthy after 19 days. Blood from these three failed to show the presence of agglutinins.

In view of this and previous experiments, the failure to demonstrate the presence of immune bodies in acute sporadic cases in equine would not appear so disconcerting.

TABLE 10—GUINEA-PIG, RAT AND MOUSE INOCULATIONS, GARTNER'S BACILLUS, STRAIN "Rv," DECEMBER 17, 1918.

ANIMAL	WEIGHT	QUANTITY AND METHOD	DATE OF DEATH
	Grams		
Guinea Pig	260	.01 c.c. intraperitoneally	January 12, 1919
Guinea Pig	300	.02 c.c. intraperitoneally	January 4, 1919
Guinea Pig	210	.02 c.c. subcutaneously	December 28, 1918
Rat	90	.05 c.c. intraperitoneally	December 25, 1918
Rat	90	.01 c.c. intraperitoneally	December 23, 1918
Rat	90	.01 c.c subcutaneously	January 3, 1919
Mouse		.05 c.c. intraperitoneally	December 19, 1918
Mouse		.01 c.c. intraperitoneally	December 18, 1918
Mouse		.01 c.c. subcutaneously	December 21, 1918

These feeding experiments of small animals were performed to endeavor to gauge a dose for future immunity experiments, but this method of infecting was not found practicable.

GUINEA-PIG INOCULATION EXPERIMENT, May 7, 1919.—The infection of small animals by feeding proving too unreliable, the following inoculation experiment was conducted in order to arrive at a lethal dose to be employed in a subsequent protective experiment. It will be seen from Table 14 that the animals died in rotation, according to the amount of organism inoculated. While it appears at the present time that a much smaller dose might have been employed with greater success in the experiment to follow, notwithstanding, the dose of 1 c.c. was selected as a standard.

GUINEA-PIG INOCULATION EXPERIMENT, May 26-27, 1919.—Having decided upon the use of 1 c.c. of a standard suspension of strain No. 1 of Gartner's bacillus as the amount for an immunity experiment, 22 apparently normal guinea pigs were selected and inoculated

TABLE 11—RABBIT INOCULATION EXPERIMENT, GARTNER 104-B, DECEMBER 2, 1918.

NUMBER	WEIGHT	DOSE	DATE OF DEATH	RESULTS
	Grams			
249	1,063	1 c.c. subcutaneously	Dec. 15, 1918	Abscess at point of inoculation, extending full length of abdomen. Pneumonia in right lobe of lung.
250	1,453	2 c.c. subcutaneously	Dec. 8, 1918	Infiltration of subcutaneous tissue at point of inoculation with thick gelatinous exudate.
251	1,643	1.5 c.c. subcutaneosly	Dec. 11, 1918	No autopsy.
252	1,100	0.1 c.c. intraperitoneally	Dec. 6, 1918	Pleuro-pneumonia; 5 c.c. seropurulent exudate in left pleural cavity; streptococcus in stained smears of heart blood.
253	867	0.15 c.c. intraperitoneally	Dec. 10, 1918	Same as 252. Inoculation proved to be intramuscular.
254	1,868	0.2 c.c. intraperitoneally	Dec. 4, 1918	No lesions observed. Gram negative bacilli in heart blood.
255	1,138	0.1 c.c. intraperitoneally	Dec. 5, 1918	No specific lesions observed. Heart blood negative.
256	1,100	0.15 c.c. intravenously	Dec. 4, 1918	No lesions noted on postmortem. Gram negative bacilli in heart blood.
257	963	0.2 c.c. intravenously	Dec. 6, 1918	No lesions noted on postmortem. Gram negative bacilli in heart blood.

TABLE 12—GUINEA-PIG FEEDING EXPERIMENT, APRIL 17, 1919.

No.	WEIGHT	SUSPENSION	AMOUNT	DATE OF DEATH	RESULTS
	Grams		c.c.	1919	
1	143	Gärtner's bacillus 104-B	3.5	April 21	Postmortem: Few punctiform hemorrhages in mucous membrane of stomach; small pneumonic area in lower left lobe of lung. Cultures on endo and blood negative.
2	120	Gärtner's bacillus, axillary vein	2.0	April 20	Postmortem: Slight congestion of lower right lobe of lung; other organs normal. Cultures on blood and endo negative.
3	200	B. paratyphoid B	2.0	April 21	Postmortem: Slight congestion of lower left lobe of lung. Cultures on endo and blood negative.
4	280	Gärtner's bacillus, QMC	2.0		Alive at end of 8 days and apparently healthy. Blood serum demonstrated no agglutinins.
5	287	Gärtner's bacillus No. 1	2.0		Alive at end of 8 days and apparently healthy. Blood serum demonstrated no agglutinins.
6	215	B. coli communis	4.0	April 21	Postmortem: All organs apparently normal. Cultures on endo and blood negative.

intraperitoneally with varying amounts of immune serum. This serum had been prepared in rabbits and showed a high agglutinating titre. (See Table 22 under "Agglutination Tests.")

Twenty-four hours after administration of the serum 1 c.c. of a standard suspension of *B. enteritidis* (Gartner) was inoculated intraperitoneally. The control animals which received no serum died 12 hours later. Animal No. 310 also died the following day. The organism was not recovered from the heart blood. The animals lived for varying intervals of time, the last succumbing 10 days later. All animals showed marked hemorrhagic infiltration at the point of inoculation and in some instances an enlarged spleen. No other anatomical changes were noticed.

TABLE 13—GUINEA-PIG FEEDING EXPERIMENT, FOUR STRAINS OF GARTNER'S BACILLUS, 104-B, Sp.-2, RV, QMC, POOLED. APRIL 28, 1919.
Pigs Weighed Approximately 150 Grams.

NUMBER	AMOUNT	DATE OF DEATH	RESULTS
	c.c.		
1	2		Alive May 15, 1919. Bled and agglutinated; results negative.
2	2		Alive May 15, 1919. Bled and agglutinated; results negative.
3	3	May 11, 1919	Postmortem. No anatomical changes. Cultures from all organs on blood and endo negative.
4	3	May 7, 1919	Postmortem: No anatomical changes. Cultures from all organs on blood and endo positive.
5	4	May 13, 1919	Postmortem: No anatomical changes. Cultures from all organs on blood and endo negative.
6	4		Alive May 15, 1919. Bled and agglutinated; results negative.

TABLE 14—GUINEA-PIG INOCULATION EXPERIMENT (INTRAPERITONEALLY) TO DETERMINE LETHAL DOSE.

Agar Culture, 48-Hour Growth, Standardized, Gartner No. 1. Inoculated May 7, 1919.

NUMBER	WEIGHT	AMOUNT	DATE OF DEATH	RESULTS
	Grams	c.c.		
301	350	0.5	May 13, 1919	Postmortem negative. Organism recovered from all organs. Lived 144 hours.
302	340	1.0	May 10, 1919	Postmortem negative. Recovered from all organs. Lived 72 hours.
203	350	1.5	May 9, 1919	Postmortem. Subcutaneous hemorrhagic infiltration; axillary gland hemorrhagic. Recovered from all organs. Lived 40 hours.
304	372	2.0	May 8, 1919	Postmortem: Subcutaneous hemorrhagic gelatinous infiltration; organs normal. Recovered from all organs. Lived 18 hours.
305	200	2.0	May 8, 1919	Postmortem negative. Recovered from all organs. Lived 24 hours.

It will be noticed that the serum dose was rather small, due to the scarcity of the serum, and whether the prolongation of life demonstrated virtue in the serum or whether it was merely a demonstration of the Pfeiffer phemonenon is questionable.

Serums Nos. 3 and 1 were from rabbits which received Berkefeld filtered bouillon cultures of Gartner's bacillus. (See Table 22 under "Agglutination Tests.")

Details of this experiment are given in Table 15.

TABLE 15—GUINEA-PIG INOCULATION EXPERIMENT (PROTECTIVE).
Agar Cultures Gartner No. 1, 48-hour Growth, Standardized. Animals Inoculated with Serum May 26, 1919. Inoculated with Bacteria May 27, 1919.

No.	SERUM		Bacterial Suspension	Date of Death	RESULTS
	Amount	Strain			
	c.c.		c.c.		
309	0.5	No. 5	1	June 4, 1919	Hemorrhagic infiltration at site of inoculation. Organisms recovered from all organs.
310	1.0	No. 5	1	May 28, 1919	Postmortem same. Organisms recovered. Heart blood negative.
311	1.5	No. 5	1	June 2, 1919	Postmortem same. Organisms recovered from all organs.
312	2.0	No. 5	1	June 1, 1919	Postmortem same. Organisms recovered from all organs.
313	3.0	No. 5	1	June 2, 1919	Postmortem same. Organisms recovered from all organs.
314	0.5	No. 1	1	June 5, 1919	Postmortem same. Organisms recovered from organs.
315	1.0	No. 1	1	June 4, 1919	Postmortem same. Organisms recovered from organs.
316	1.5	No. 1	1	June 1, 1919	Postmortem same. Organisms recovered from organs.
317	2.0	No. 1	1	June 2, 1919	Postmortem same. Organisms recovered from organs.
318	3.0	No. 1	1	June 1, 1919	Postmortem same. Organisms recovered from organs.
319	0.5	Nos. 3 & 7	1	June 1, 1919	Postmortem same. Organisms recovered from organs.
320	1.0	Nos. 3 & 7	1	June 5, 1919	Postmortem same. Organisms recovered from organs.
321	1.5	Nos. 3 & 7	1	June 5, 1919	Postmortem same. Organisms recovered from organs.
322	2.0	Nos. 3 & 7	1	May 31, 1919	Postmortem same. Organisms recovered from organs.
323	3.0	Nos. 3 & 7	1	May 31, 1919	Postmortem same. Organisms recovered from organs.
324	0.5	Horse N	1	June 2, 1919	Postmortem same. Organisms recovered from organs.
325	1.0	Horse N	1	June 2, 1919	Postmortem same. Organisms recovered from organs.
326	1.5	Horse N	1	June 2, 1919	Postmortem same. Organisms recovered from organs.
327	2.0	Horse N	1	June 4, 1919	Postmortem same. Organisms recovered from organs.
328	3.0	Horse N	1	June 1, 1919	Postmortem same. Organisms recovered from organs.
*329	None	.....	1	May 28, 1919	Hemorrhagic infiltration at site of inoculation. Organisms recovered.
*330	None	.....	1	May 28, 1919	Hemorrhagic infiltration at site of inoculation. Organisms recovered.

*Controls.

(To be continued.)

POTASSIUM IODIDE IN MALNUTRITION OF PIGS

By J. J. FREY

Veterinary Pathologist, Division of Animal Industry, Sacramento, Calif.

EARLY in the fall, the owner of a herd of hogs in the foothill district of the Sacramento Valley reported a disease among his suckling pigs, which he described as follows:

When about three days old, scalded-like areas appeared around the mouth, on face and ears. These did not penetrate the skin, nor resemble the lesions of necrobacillosis. There was a distinctly noticeable enlargement in region of the thyroids. While retaining a good appetite, they became emaciated, the skin developed a scurvy-like surface, was wrinkled all over the body, and was hard to the touch. These symptoms progressed with increasing weakness, until the pigs finally lay on their sides, unable to rise, and died in the course of a couple of days more.

About fifty pigs, all belonging to six sows, that had farrowed about the same time, were affected without an exception. The course of the disease appeared to be from two to six weeks. The mothers remained healthy, as did all the other hogs of various ages on the place. There was no history of cholera in the vicinity. The affected pigs retained clear eyes; there was no reddish discoloration of the skin, nor were the typical internal lesions of cholera present.

The condition suggested some form of malnutrition, and called to mind the article by E. B. Hart and H. Steenbock, of Wisconsin Laboratory of Agricultural Chemistry, on Thyroid Hyperplasia and Relation of Iodine to the Hairless Pig Malady in the *Journal of Biological Chemistry*, February, 1919, and a succeeding article in the JOURNAL of the A. V. M. A. by Howard Welsh, of Bozeman, Montana, in which he stated that iodine is a specific prevention for hairless pigs and goitre in lambs and calves.

Accordingly it was advised that about two grams of potassium iodide be dissolved in water and mixed with mash and fed to the sows and litters daily.

The owner reported that 21 head were lost until time of treatment, when almost immediate improvement was noticed and continued until the situation was entirely cleared.

This report is submitted as a corroboration of the articles above mentioned.

ABSTRACTS

A Filter-Passing Virus in Certain Diseases.. By Sir John Rose Bradford. Royal Inst. of Great Britain, May 30, 1919. Reprint, 13 pp. A presentation of the work carried out during the last two years in the British Expeditionary Force in France, with the co-operation of Captains J. A. Wilson and E. F. Bashford on the etiology of such diseases as influenza, rabies, nephritis, poliomyelitis, etc.

The results of the work carried out at Etaples may be summarized as follows: Filter-passing organisms have been isolated by culture from the blood and from the secretions of the body in a considerable number of diseases of obscure origin. These organisms fall into two definite groups. The first and smaller group consists of those entitled to be called globoids. The second and much more numerous group is that of the true filter-passers. The so-called globoids are characterized especially by the fact that on staining they show a distinct differentiation into a central darkly-staining and a peripheral less stainable zone. The latter has often a somewhat indefinite outline, so that it is difficult to separate with sharpness one individual from its neighbors. The non-globoid filter-passers are, on the other hand, extraordinarily sharply defined, although often extremely minute. The different members of this series present individual morphological differences.

The dimensions of the different organisms isolated are as follows: Rabies, rounded body, diameter 0.1 to 0.3 micron. Influenza, rounded or oval coccus-like body, 0.15 to 0.5 micron. Trench fever and nephritis, 0.3 to 0.6 micron. The organisms isolated in polyneuritis and encephalatis are definite globoids varying in size from 0.2 to 0.5 micron.

The filter-passing virus of some of these diseases is unquestionably conveyed from the sick to the healthy through the agency of insects. W. N. Berg.

Discovery of a Case of Glanders In Man Through Serum Diagnosis. By Staff Veterinarian Breithor. In Ztschr. Veterinärk, Feb., 1919.

The animal blood testing station No. 6 received a sample of blood from a soldier to be tested for glanders with the following history:

A teamster had handled a horse with nasal glanders. He became ill and was admitted to the hospital suffering apparently with symptoms of pleuropneumonia. After 14 days of sickness the patient apparently was again well. Later, swellings appeared on both ankles and one of these delevoped into an abscess. Along with this the patient had an intermittent fever. This last symptom suggested the thought of glanders. The blood test showed the following: 0.5 c.c. of serum gave complete fixation of complement; 0.01 c.c. incomplete fixation; agglutination 500.

As a control of the test, serum from another soldier who was suffering with pleurisy was used, and this came negative.

Subsequently a decided improvement in the condition of the patient took place. He walked about without difficulty. Six weeks later, however, he became decidedly worse. Clinical examination gave a negative result.

The blood test applied again resulted in 0.1 c.c. serum giving complete fixation of complement; 0.02 c.c. incomplete fixation; negative agglutination.

Later on nodules the size of a pea appeared in the shoulder region. Fourteen days later the patient died. On postmortem the following was noted: Scars on the nasal mucous membrane; acute inflammation of the nasal mucous membrane; an abscess in the right lung the size of a pea. Heart normal. Swelling of testicles. Many circumscribed brown nodules in the skin of the shoulder region. Diagnosis, glanders.

H. W. SCHOENING.

REVIEWS

SURGICAL AND OBSTETRICAL OPERATIONS. By W. L. Williams, Professor of Obstetrics and Research, New York State Veterinary College, Cornell University. Fourth edition, revised, pp. 196. Published by the author, Ithaca, N. Y., 1919.

The fourth edition of "Surgical and Obstetrical Operations" by Prof. W. L. Williams, of Cornell University, has just been published, with the collaboration of Dr. James N. Frost, Professor of Surgery, of the same college. The fact that this little book has gone to the fourth edition alone shows its worth and appreciation by the veterinary profession. While this work is intended as a students' guide, the average busy practitioner who is required to do his own operating will find in it a wealth of condensed information.

The technique of 59 operations is described and well illustrated.

The operation selected for description is usually that one which has been found by the author's long surgical experience to be practical. Several operations not appearing in former editions are described, including dehorning, rumenotomy, resection of intestines, and cryptorchid operation. Trephining of the facial sinuses is especially well described and illustrated. The operation for roaring has been brought up to date and is well illustrated. More modern operations for several diseases or conditions are described.

The book is smaller in size than former editions, but contains more text and many more illustrations. Altogether this small book is one of the most useful that the veterinarian can own.

J. P. T.

VETERINARY OPHTHALMOLOGY. By Dr. Eugene Nicols, Veterinary Major, French Army. Translated, edited and enlarged by Henry Gray, M. R. C. V. S. Pp. 598. Printed and published by H. W. Brown, 20 Fulham Road, London, S.W., 1914.

"Veterinary Ophthalmology" is a valuable contribution to veterinary literature; it is a thoroughly scientific and complete discussion of diseases of the eye in domestic animals. Evidently the author has had a wide experience, which has been supplemented with numerous references and illustrations from the best continental authorities to produce a book of great value.

There are nearly 600 pages divided into 16 chapters. The first 4 chapters, 100 pages, are devoted to anatomy, refraction, methods of examination, use of the ophthalmoscope, etc. The chapter on refraction is rather complex and will be of no great value to the average veterinarian. Methods of examination and the use of the ophthalmoscope are clearly presented and well illustrated. Directions for the use of the ophthalmoscope to recognize turbidities of the media are excellent, though the author omits mention of the very useful and inexpensive retiniscope for illumination of turbidities of the vitreous humor, where it is superior to the ordinary ophthalmoscope.

While the text is excellent throughout, the discussions of symptoms and treatment will appeal very strongly to clinicians. Nearly 100 pages are devoted to the uveal tract, and to anyone who has given much attention to diseases of the eye in animals this is a highly interesting and instructive chapter. Irido-cyclitis in all its clinical forms is described clearly and in great detail. One short paragraph describes traumatic irido-cyclitis due to contusion without

a wound, the possibility of its occurrence, its causes and symptoms. (It is an interesting coincidence that the reviewer was interrupted at this point to treat a case of traumatic irido-cyclitis in a cow caused by a blow with a blunt object that failed to produce any external injury.) Periodic ophthalmia receives a very thorough and exact description; the part devoted to treatment is especially fine. The author describes about every form of therapeutics that has been tried, but does not mention the injection of Lugol's solution into the supraorbital fat, a treatment that has found considerable favor in America during the past few years.

It is stated that contagion has not been proved in epizootic keratitis in cattle; evidently the author has not had a wide experience with this disease. After seeing it extend rapidly from herd to herd following the introduction of an infected cow from a distant stockyard it is difficult to imagine any other means of extension.

The book is convenient in size and the publishers have adopted a high standard of material and workmanship. D. H. U.

STUDIES ON ACARI. No. 1.—THE GENUS DEMODEX OWEN. By Stanley Hirst, Assistant in the Department of Zoology, British Museum. V+44 pp., 4 figs., 13 pls., 53 figs., quarto. British Museum (Nat. Hist.), London.

Hirst has discussed all the known species and varieties of the follicular mites of the genus *Demodex*. He states that these mites are usually quite innocuous, being of common occurrence in apparently healthy and normal animals, but notes the records of various authors who have found *Demodex* in association with acne rosacea, localized pigmentation, lichen spinulosus, blepharitis, impetiginous eruptions, seborrhea, maculose skin complaints, cancer, and conditions resembling alopecia areata, molluscum contagiosum and tinea versicolor. Demodectic mange in the dog, cat, horse, cattle, pigs and goats is discussed at some length and some of the treatments used are given. Hirst has never found the mites on the skin or attached to the hairs of the host, the mode by which the mites are disseminated being yet uncertain.

Hirst regards the Demodicidæ as a degenerate branch of the Cheletidæ. Contrary to what is commonly stated of *Demodex*, he finds the internal tracheæ noted by Csokor. These are of a type similar to that in the Cheletidæ, and have their apertures in the ventral surface of the capitulum. A dorsal spine on the proximal segments of the palpi is regarded as a feature of value in the differ-

entiation of species, but the reviewer does not find that the descriptions of these spines lend themselves readily to the compilation of a key. Hirst agrees with Berlese that the legs have five segments and not three as is usually stated. In disagreement with much that has been written on this subject, he finds that the penis is a comparatively large, slender, rodlike structure, usually consisting of two parts and protrusible through an aperture on the dorsal surface of the cephalothorax, usually above the interval between the first and second legs or slightly anterior of this point.

Hirst gives a list of the known species and varieties with their hosts and distribution, and gives descriptions of the species with figures of those examined by him. He does not give the measurements of the penis for all of the involved species, even where he has seen and described it, though this structure might be of considerable specific value in this group as it has been in the nematodes. There are also some misstatements and some confusing statements, evidently inadvertent. Thus on page 14 we note: "The second and third segments [of the palpi] are freely movable. There is a well marked tubercle or spine in this segment." The spine, it appears, is on the first or proximal segment. On page 30 is the statement regarding *D. muscardini:* "Width of cephalothorax a little more than four times up to four and a half times the total length of the body." The reverse of this statement appears to be true. The follicular mite of man is referred to on page 19 as *Acarus folliculorum* Simon, 1843. The evidence available to the reviewer indicates that this date should be 1842.

It is to be regretted that Hirst did not compile a key to the species of *Demodex*. Such keys are a great aid to other workers and can be best prepared by those who have worked out the involved species, as Hirst has. It is possible that Hirst did not find that a satisfactory key could be compiled, and this is probably true, as the genus, so far as may be judged from Hirst's monograph, is still separated, largely on a basis of hosts, into species or varieties that grade into one another with overlapping features as regards practically all of the structures that may be considered as of possible specific value.

M. C. H.

ARMY VETERINARY SERVICE

NEWS FROM THE SURGEON'S OFFICE

Number of Veterinary Officers on Duty .

THE Office of the Surgeon General of the United States Army has furnished the following information as to veterinary officers on duty.

Officers, Veterinary Corps, United States Army, with temporary rank as authorized by Congress in act providing for 18,000 officers until June 30, 1920, on duty on dates shown:

	Dec. 11, 1919	Jan. 11, 1920
Colonels	0	0
Lieutenant Colonels	4	4
Majors	37	35
Captains	72	73
First Lieutenants	156	148
Second Lieutenants	72	76
Totals	341	337

Officers, Veterinary Corps, Regular Army, with permanent rank under act of June 3, 1916, on duty January 11, 1920:

Majors	7
Captains	17
First Lieutenants	21
Second Lieutenants	47
Total	92

Transfers and Reassignments

The following orders of transfer and reassignment have been issued for veterinary officers:

Captain Hume F. Spencer, V. C., from Camp Funston, Kans., to Camp Upton, N. Y., as Camp Veterinarian.

Captain H. H. Howe, V. C., from Remount Depot, Camp Gordon, Ga., to Remount Depot, Camp Grant, Ill., for duty as the Veterinarian.

Captain F. C. Sager, V. C., from Camp Grant, Remount Depot, to Chicago, Ill., for instruction in meat inspection.

Captain C. C. Bourland, V. C., from Fort Bliss, Tex., to Department Laboratory, Philadelphia, Pa., for course of instruction.

Captain J. L. Ruble, V. C., from Chicago, Ill., to Fort Brown,

Brownsville, Tex., for duty as Post Veterinarian, and Brownsville District, Brownsville, Tex., for duty as District Veterinarian.

Captain E. P. O'Connell, V. C., from Chicago, Ill., to Fort Sam Houston, Tex., for duty as Post Veterinarian.

Major F. C. Hershberger, U. S. A., from Camp Upton, N. Y., to Marfa, Tex., as District Veterinarian, Big Bend District, and Camp Veterinarian, Marfa, Tex.

Major W. B. Cook, U. S. A., from Camp Travis, Tex., to Douglas, Ariz., for duty as District Veterinarian and Camp Veterinarian, Camp Harry J. Jones, Douglas, Ariz.

Major G. H. Koon, U. S. A., from Chicago, Ill., to Washington, D. C., for duty in the Surgeon General's Office.

CARY CALLS COMMITTEE ON LEGISLATION

PRESIDENT C. A. CARY, who had been in attendance at the Ohio State Veterinary Medical Association meeting in Columbus, reached Washington, D. C., on January 17, for the purpose of investigating the progress being made by the Congressional committees in the reorganization of the Veterinary Corps. He was accompanied by Dean D. S. White of Columbus, whose military experience as Colonel in the Veterinary Corps proved of great assistance to Dr. Cary in discussing the military phases of this subject with the Congressmen interviewed. As a result of these conferences President Cary became so deeply impressed with the need of immediate action that he wired the various members of his Legislative Committee to meet him in Washington on January 21. Drs. Turner, Walkley, Hoskins, and Munce responded and together with S. E. Bennett and representatives of the Army and the B. A. I., the ways and means of obtaining appropriate consideration for members of our profession in the Army were fully discussed and then presented in forceful argument to various members of Congress. It was predicted that much good will be accomplished by this concerted action of our fellow members.

REORGANIZATION OF THE VETERINARY CORPS

The reorganization of the Veterinary Corps at this time is a matter of utmost importance, not only to the Army but to the entire profession in the United States. It is vital that the veterinary profession be recognized in the Army on a parity with the other professional and technical services, so that its officers may be given the

same consideration with regard to rank and an adequate enlisted force of assistants. However, if the present provisions of Senate Bill 3688, introduced January 9, 1920, remain unchanged, the Corps, instead of receiving the recognition accorded to all other professional services, will be classed with the only nonprofessional service in the Medical Department, the Medical Administrative Corps (the present Sanitary Corps). The Medical and Dental Corps officers in this bill enter with the grade of first lieutenant and are promoted through the grades to colonel after 26 years' service. The Veterinary and Administrative Corps officers enter as second lieutenants and are promoted to the grade of major after 20 years' service, except that officers of the Veterinary Corps may reach the grade of lieutenant colonel after 25 years' service.

It is not conceivable that such lack of consideration will be allowed to pass unchallenged by the profession in America. No other profession gave more willingly of its services to the country during the war. The Corps was organized under many handicaps, and, in spite of the seemingly insurmountable difficulties, the signing of the armistice found it functioning as a professional medical service both in this country and in France.

Section 33 of the proposed Senate Bill reads as follows: [1]

"The Veterinary Corps shall consist of one hundred and fifty commissioned officers in grades from second lieutenant to lieutenant colonel, inclusive. Hereafter commissioned officers of the Veterinary Corps shall be promoted, if in Class A as provided for in Section 44 of this Act, to the grade of first lieutenant upon the completion of five years' service, to the grade of captain upon the completion of ten years' service, to the grade of major upon the completion of twenty years' service, and to the grade of lieutenant colonel upon the completion of twenty-five years' service. * * * *Provided*, That not to exceed 1,500 of said enlisted force shall be assigned to duties related to the Veterinary Corps."

There are now 340 veterinary officers on duty, and the demands of the War Department can not be complied with in so far as the supplying of officers is necessary to give veterinary service to the entire Army. It is beyond our power of vision to see how this work is to be accomplished by only 150 officers. In order to meet the needs of the Army proposed by this bill the Corps will require not less than 340 officers in grades from first lieutenant to colonel, inclusive, with promotions similar to those provided for the medical and

[1] An amended bill, S. 3792, was introduced on Jan. 23, 1920, which removes practically all these unsatisfactory features.

dental officers and chaplains; also 3,000 enlisted men in the established grades.

The House Military Committee is in session daily also considering the draft of a bill for the reorganization of the Army. The proposed measure is virtually a revision of the National Defense Act to try to meet the present needs of the Army. It differs greatly from the Senate Bill, which includes provision for universal military training. The Veterinary Corps is provided for in Section 10 as follows:

"The Veterinary Corps shall consist of 140 officers in grades from major to second lieutenant."

Note that *no enlisted men are provided.*

To meet the needs of the Army proposed by the House Military Committee the Veterinary Corps will require approximately 340 officers in grades from first lieutenant to colonel, inclusive, and 3,000 enlisted men. There are no enlisted men provided in the House Military Committee draft, and the Veterinary Corps can not function as such without this personnel. They can not be obtained by detail from other service; for example, a remount depot has only enough men in the Quartermaster Corps to take care of the management, handling and training of the remounts, and they are generally undermanned. How can men under such circumstances be detailed to do the veterinary work?

The simplest and easiest method by which enlisted men could be provided for the Veterinary Corps would be to increase the allowance of the Medical Department by 1 per cent, which would permit the Medical Department to have enlisted force of not to exceed 6 per cent (it is now 5 per cent) of the total enlisted strength of the permanent Army, and to provide further that 1 per cent of this personnel may be detailed for strictly veterinary duties.

APPRECIATON OF SERVICES

THE following letter addressed to Capt. Lester R. Smith, V. C., commanding officer of the IV Corps Mobile Veterinary Hospital, on the eve of his departure from Germany for the States, is self-explanatory. It has been stated that the success of this Mobile Veterinary Hospital was made possible by the close cooperation and assistance of Major W. Reid Blair, Corps Veterinarian of the IV Army Corps.

A. E. F., GERMANY, May 11, 1919.

To CAPTAIN LESTER R. SMITH, V. C.:

1. The IV Army Corps Mobile Veterinary Hospital having been relieved from duty with the IV Corps, the Commanding General takes this opportunity to express his appreciation to the commanding officer and the men of that unit for their loyal and conscientious service throughout the period of hostilities and since the signing of the armistice. The IV Army Corps Mobile Veterinary Hospital joined the IV Army Corps on the 14th day of August, 1918, and since that time has toiled with untiring energy to care for and improve the condition of the horses in this Corps.

2. This unit has always maintained a high standard of efficiency. The conduct of its personnel has been exemplary.

(Signed) C. P. SUMMERALL,
Major General, U. S. Army.

COMMUNICATION

TO THE EDITOR:

Every member of the A. V. M. A. should make a special effort to secure the passage of that part of the Senate plan of reorganization of the Army that gives to the Veterinary Corps the rank of Colonel and Lieutenant Colonel, providing that these places shall be filled by veterinarians and not cavalry officers or medical men.

The questions of the size of the Veterinary Corps, its personnel and the percentages of higher rank as well as universal military training are all questions for each member to determine for himself individually.

All these latter as well as military veterinary school involve the question of a permanent peace and the onerous taxation of all the people, rich and poor, and every thinking man will determine his stand upon these problems according to his convictions.

Let us be a unit as to the need of sufficient rank for the Corps to function properly with all other technical branches of the army service.

W. HORACE HOSKINS.

A recent report from the Philippines indicates that a general outbreak of surra is prevailing among the horses of the War Department and that a fresh infection of glanders is causing further anxiety to the official veterinarians.

ASSOCIATION NEWS

Proceedings of the Fifty-Sixth Annual Meeting of the American Veterinary Medical Association

Held at the Hotel Grunewald, New Orleans, La., November 17 to 22, 1919

Monday Morning, November 17, 1919

The meeting was called to order by President V. A. Moore, at 10:30 a. m.

The President: The time has come when the Fifty-Sixth Annual Convention of this Association shall come to order. We are very glad to be in this beautiful city and to receive the words of welcome from its most honored representatives. We are very sorry to announce that the Governor of the State has been called by other business so that he can not be present, but he has asked Dr. Dalrymple to represent him on this occasion. I have great pleasure in introducing Dr. Dalrymple. (Applause.)

Dr. W. H. Dalrymple (Baton Rouge, La.): Mr. President, Honored Guests, Members of the American Veterinary Medical Association: The Governor had accepted the invitation to be present on this occasion, but usually the Governor of the State is a very, very busy man, and he does not know when he will be called away. In a letter here he states his regrets at not being able to attend the American Veterinary Medical Association meeting. When I got this letter I called the Governor up and told him that it wouldn't do for me to address a welcome, that I was one of the people that he was supposed to welcome rather than that I welcome the people. However, I want to say, not to make a speech, that I am extending the Governor's hearty welcome to the Association to New Orleans.

I may express my own personal pleasure in seeing that I am having my own wishes gratified, after twenty years of invitation. I think I have invited the Association every year for twenty-five years, and now it is here. We have a good representation, and I can assure you that I feel very much gratified at the occasion. I also want to assure you that the Governor is very much interested in our work and is very sorry that he couldn't be with us today. (Applause.)

The President: I think that we are all very glad that Dr. Dalrymple's wishes have been gratified and that we are here.

I now have the pleasure of introducing the Mayor of New Orleans, who is to give us a few words of welcome. (Applause.)

Mayor's Address of Welcome

Mayor Martin Behrman (New Orleans): Mr. Chairman, Gentlemen of the American Veterinary Medical Association, and Ladies:

I don't suppose it is necessary for me to say to the delegates who attended the convention in New York a few years ago that I am glad you are here, because I traveled to New York and invited you to come here. Of course something happened that kept you from coming up to this time, but we American people had something to do that kept you from coming here at that time. I think the people of this country have made a very good job of it, and we are glad it is finished, so that you had the opportunity to come to New Orleans.

You know no man's life is complete until he has come to New Orleans. (Applause.) I know everywhere that I go—and I have traveled considerably and I meet a great many people—they all express a sinister desire to come to New Orleans. I haven't traveled much since the first of July, and I don't know if that applies to the same extent that it did prior to the first of July. (Applause.)

Of course, a wonderful change has taken place for those who have lived here all of our lives, and we have lived here a long time. The city is 201 years old and those sudden changes have shocked some of us, but we are getting accustomed to it, and we are not going to miss it. We have a wonderful supply (Laughter and applause)—not what you think (Laughter)—water. The great Mississippi River flows by our doors, gives us an unlimited water supply, and through our wonderful filtration plant we furnish that wonderful water to all of the homes, all of the institutions, purer, at a cheaper price, than any city in the country. So don't be afraid to drink the New Orleans water—and we want you to drink water—(Laughter) because there is an old adage—I will tell it to you in French: "Si vous buvez une fois de la Mississippi, le désir vous fera y retourner." It means, in the language that we talk, "Once you drink of the Mississippi water, you shall always return."

So, in the days that have gone by, that date back of July, we used to say to people that came to New Orleans that we insist that you at least drink one glass of water while you are in New Orleans, because we are impressed with the truth of that adage and we know that once you drink of that water you will return, and we want you to come again.

We want you to come to a city that has made history for this country. You know, gentlemen of the Association, that the successful fights against pestilence and floods were made here, and we are proud of the record made in those various fights. There was some time perhaps in the long ago that we would not have asked you to New Orleans. We were not ready to receive you. We did not want strangers in large numbers to come around and see what we had. Of course our people in the South had suffered a great deal here. We suffered from the war between the States, and the reconstruction days that came after that war. We suffered from pestilence and flood. We put them in the background and now they are behind us. We have built up magnificent systems of drainage. We are ready and glad to have conventions, such as we see here

this morning, to come to New Orleans. We know that every convention that comes brings the picked men of the country, and for that reason we are glad to have conventions come to New Orleans, look us over, see what we are doing, see what we are going to do presently, and learn what our hopes and aspirations are.

We have a magnificent city. We have 196¼ square miles within its limits. We have plenty of room to bring those who feel they are not doing as well where they live down to New Orleans and take advantage of the things that the good God Almighty has given us.

I am glad that you brought so many ladies here with you. I surmise that they are most intelligent ladies, that they are most thoughtful ladies, because they accompanied their husbands to New Orleans. (Laughter.) You know New Orleans has the reputation of having the handsomest women in this country, but when I go and visit other cities I see the same kind. Of course you know about the South's chivalry to women, and the reputation is deserved.

Now, dear ladies, you will find much here to interest you. This is one of the old cities of the country. You go to the average big city and you see the same thing. You see the tall buildings, the fast-moving trains, electric cars, and so on. Here you come to a city just a little different from the others. Canal Street, a wide street, divides the old town from the new. Down below Canal Street you will see scenes that will remind you of Spain and France, but on Canal Street you will see the up-to-date, hustling American city. That street is full of history and romance, and we are going to maintain it for all time to come. Glorious pages of history are written with the deeds performed that brought about and maintained that section.

The men are interested in knowing what this great community is doing. We have here the most magnificent harbor in the country. We are the second port in the United States as to imports and exports. We are, however, the first port as to efficiency. This sounds like egotism, but every word that I am telling, ladies and gentlemen of the convention, you will see borne out before you leave here. The city and State combined own the terminals. The State owns all the docks and great warehouses, but connecting all those is a railroad owned by the City of New Orleans. These public utilities are not built for the purpose of making money for the stockholders. They are built to render efficient service, to encourage coming to the port. So far as a port town is concerned, it is all public ownership, in the hands of the people, operated for them, by them, in the interest of those who want to use them.

The public school system here is unexcelled. There are 87 magnificent temples dedicated to the cause of public education. We have two great universities, great medical schools, and we are doing everything we can to encourage those who live here to stay here and to bring those who are looking for a better place to come to.

Let me say to the gentlemen of your Association that we are interested in the work that you are doing. It so often happens that those

of us who live in the great cities pay very little attention to the work that men of your profession do; but here in New Orleans—and I believe that those in your profession will vouch for it—we are interested. We want to assist, and we do assist, in the legislation to do what is necessary for your profession. One branch of your profession that engaged in the eradication of the tick had every representative in the House and Senate for them. That made tick eradication possible. We are interested in your work. (Applause.)

You know the great good that comes from these conventions; men of the same profession coming from different parts of the country, intermingling, exchanging views and ideas, imparting knowledge from one who has acquired it to those who have not.

I am glad to see that so many busy men can come to a convention. I am reminded of the story of the busy man. He was apologizing to the convention that there were so few men from his own city there. They were too busy attending to their own business to attend to the business of the country. I told them that it reminded me of an Italian who came before Judge Foster of the Naturalization Court for naturalization.

The Judge said, "Tony, who is the President of the United States?"

"Mr. Wils'."

"Fine! Who is the Vice-President?"

"Mr. Marsh'."

"Why, that is fine, Tony!"

It was a little abbreviated, but he knew.

"Now, Tony, could you be President of the United States?"

"Me, Mr. Judge? Oh, no. I'm too busy with my banana stand." (Laughter.)

That is the great trouble in all branches of business today. Some men are too busy at home to help mold an opinion by getting together with his own brothers in his line.

I am glad you have come. I hope that the sessions and clinics of your convention will be successful. I hope when you return home you will have nothing but pleasant recollections of your visit to New Orleans. (Applause.)

THE PRESIDENT: In addition to the Mayor, we have a word of welcome from Dr. Oscar Dowling, President of the Louisiana State Board of Health. (Applause.)

WELCOME BY DR. DOWLING

DR. OSCAR DOWLING: Ladies and Gentlemen, the Mayor may have aroused your hopes, may have increased the flow of gastric juice and possibly caused your heart to leap with joy, but I want to assure you that there is an ample supply of Mississippi cocktails and you can get them at any soda water stand.

It is a steretoyped expression with us to say that we are glad to see you. We are always interested in the preservation of health. When I first undertook the work, my initial invitation was sent to interest the women. I wrote a letter and quoted this:

"They talk about a women's sphere as though it had a limit.
There's not a single joy or woe,
There's not a whispered yes or no,
There's not a life nor death nor birth,
There's not a thimbleful of mirth,
Without a woman in it." (Applause.)

I felt that if we could get the help of the women, it would be a great thing.

My next request went to the Bureau of Animal Industry, who assigned a man who went with us on the health train when we began operating in 1910. This splendid representative from the Bureau of Animal Industry explained to the people the need of the tuberculin test, and he began the test. A thing of that kind had been unheard of by our people. Since then we have had associated with us Dr. Tuck, who has done excellent work, and has wrought miracles in getting people to have their cows tested for tuberculosis. He has had the cooperation of the members of your Association throughout this test.

I need not say how glad we are to welcome you this morning. New Orleans and her citizens are pleased always to have within her gates men who, like you, are attempting to apply the principles of science. More particularly are we glad to have those whose purpose is the amelioration of suffering and the prevention of those conditions which are a menace to the health and well-being, therefore the prosperity and happiness, of the people.

I have been associated for years with a number of your coworkers, among them Doctor Dalrymple of the University, of Baton Rouge. He has been my good friend on many occasions and from him and others I know something of the achievements, scope, purposes and outlook of your Association. It goes without saying that a State Health Officer—in fact all medical men—fully appreciate and are in complete accord with the actual work daily accomplished.

The growing importance of the relation between the science of diseases of animals and the science of diseases of men is clearly apparent. They are correlatives—each a help to the other. Every step made by you toward a better understanding of the cause of animal disease, every step which means prevention of the spread of many of these means progress in the control of some human maladies and a lessening of the sum total of human disability and suffering.

In 1916 there were 4 cases of anthrax; in 1917, 27 cases; 1918, 13; and 1919 to November 1, 3 cases, a total of 47. During these four years to June 1, 1919, there were 9 deaths. The spread of the infection can be traced unmistakably to ignorance. For the illumination of those most concerned you, as medical veterinarians and medical men, *per se*, are responsible. If in the coming year we could make this clear—make it so well known that there would not be a case of human anthrax, it would be indeed an achievement

worthy of our joint effort. I shall not take your time to give further illustrations—they are better known to you than to me.

This thought leads to an expression of what is in all our hearts. A few months ago no man dreamed that there could develop a union of action by the great nations of the world for what seems—even now to some—a vague ideal. That sane, sensible, intelligent men of affairs would believe it possible, even practicable, to unite for a federation based on democratic principles—justice, equity and self-expression for all—seems utopian to a degree. Yet it was done; it is accomplished, if not wholly, in such part as to justify the hope in the hearts of millions.

We have learned—at a tremendous cost—the working possibilities of a coordination of forces and a unity of purpose. Along all lines this is a dominant thought and all organized social agencies which have the vision are making concrete in action the lesson of the twentieth century.

Again, personally and as State Health Officer, I congratulate you upon the ideal of your Association and the intelligent grasp of the present in its relation to the future which is evidenced by your program for this meeting, your plans for the future and the scientific purpose which is the basis of your effort.

If tired of or disappointed in your present home, come to Louisiana, the home of the orange blossom and the mocking bird, where people drink coffee eight times a day and women never decay.

THE PRESIDENT: We are disappointed that Dr. Adams is not able to be with us this morning to respond to these eloquent addresses of welcome. In his place Dr. David S. White of Columbus, Ohio, has consented to perform this duty.

RESPONSE BY DR. WHITE

DR. WHITE: Mr. Chairman, Honorable Mayor, Secretary and Members of the American Veterinary Medical Association: I share in the disappointment of the chairman.

When I arrived here at 2 o'clock last night, I didn't know that I would be standing before you this morning, making an effort to address you in response to the orations of welcome that you have just heard; but in my two years in the Army I learned to be a good soldier, and when my commander-in-chief ordered this thing done I felt of necessity that it must be done to the best of my ability.

I feel somewhat like a friend of mine who was a well-known public speaker and usually had at hand a ready word. He was invited to address the prisoners in chapel at the Ohio Penitentiary, and when he faced this immense audience of 2,000 people, he was awe-stricken.

"Gentlemen," he said, "I am glad to see so many of you here." (Laughter.)

I am glad that so many of you have completed your lives as I have completed my life by coming to New Orleans.

I am glad to see our venerable colleague, Dr. Dalrymple, repre-

senting the Governor of the State (applause), and I hope, Ladies and Gentlemen, that when I return to New Orleans I will find him, not representing the Governor of the State, but the Governor of the State himself. (Applause.)

If you will pardon the personal allusion, Mr. Mayor, while I am a Northerner—really a New Yorker, as I understand you are, Sir—there is an affection, a personal affection, for New Orleans. My father was a native of this city, and he laid out Pass Christian, which, as I understand, is an important suburb of New Orleans. One wing of my family lives here. I am going around to see that wing while I am here, and maybe I will get a wing. I hope I won't get a neck. (Laughter.)

I thought perhaps the Mayor, in extending to us the key of the city, would extend to us the key of the cellar. (Laughter.) I notice he didn't do that, and then I happened to think you don't have any cellars in New Orleans. Where do you keep it? (Laughter and applause.)

I don't believe anybody's life, even though he may have come to New Orleans, is entirely complete until he has partaken of that very seductive, oleaginous compound or emulsion that they call a "gin rickey," and having no cellars and the garrets not being accessible to the stranger, I am afraid we are a little up against it, and we will have to take the Frenchman's advice and drink of the great waters of the Mississippi, which I understand have been purified and sanctified for this special occasion.

I only need to tell the representatives of the Queen City and of the State of Louisiana how we appreciate the hearty southern welcome that we have received at their hands.

The veterinary profession, like the professions of medicine and law, has had a struggle for its existence. We were a new thing in a new country twenty-five years ago, and a convention such as this would not have been possible. The profession is attracting to it continuously a better type of manhood, and is fast taking its place alongside of the other professions with which we are more familiar.

We have several factors contributing toward this end, only one of which I shall mention, and that is, the American Veterinary Medical Association. We meet here or elsewhere once a year. We get together and exchange experiences. There are certain social features connected with our meetings, and wherever we have gone in the past I think we have left behind us good impressions; at least I was told in one city where this Association had held its meeting that most of the folks thought it was a convention of Presbyterian preachers. I tell this to your Honor, so that you will not feel alarmed while we are in the city.

Having given ourselves a splendid reputation (laughter), I will say in closing that we will accept and use this hospitality and will in no way abuse it. Thank you. (Applause.)

THE PRESIDENT: I have not been so fortunate as Dr. White, because I have had a long time to think about this, and a great many

subjects to choose from, and consequently I feel that he is now to be congratulated that his troubles are over and mine are to begin.

(President Moore then read his address. It was published in THE JOURNAL for December, 1919.)

THE PRESIDENT: The next item of business is the presentation and adoption of the minutes of the last meeting.

THE SECRETARY: Mr. President, I present the minutes as published in the special issue of THE JOURNAL for January, 1919. I move that they be approved, dispensing with the reading of them. (The motion was seconded and carried.)

Adjournment.

MONDAY AFTERNOON

The meeting was called to order at 2:00 p. m., President V. A. Moore presiding.

THE PRESIDENT: The first order of business this afternoon will be the report of the Executive Board.

REPORT OF EXECUTIVE BOARD

DR. N. S. MAYO (Chicago): I will take up the printed list of applications, beginning with Alabama. We have checked the names of J. H. Beckham and John Redmond.

DR. A. T. KINSLEY (Kansas City, Mo.): Mr. President, I move that the rules be suspended and these men in Alabama, except the two mentioned, be elected by acclamation.

(The motion was seconded and carried.)

DR. MAYO: Next take Arkansas. All of the three applicants have been recommended for membership.

DR. KINSLEY: Mr. President, I move you the approval in the same motion as before.

(The motion was seconded and carried.)

DR. MAYO: Next we have Arizona. All except J. C. McGrath.

DR. KINSLEY: I move you the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: Next take California. All except W. J. Lembke were recommended for membership.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All in Colorado were recommended with the exception of Charles C. Stewart.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: In the District of Columbia all have been recommended for membership except two, O. H. Basseches and Paul J. Schwarz, and they are rejected.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: The two applicants from Florida have been recommended.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: In Georgia all have been recommended for membership with the exception of C. J. Miller.

DR. KINSLEY: He comes under the suspension of rules. I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All in Idaho and Illinois have been recommended for membership.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All in Indiana with the exception of Charles J. Gruber and C. C. Winegardner have been recommended.

DR. KINSLEY: I move the recommendation be approved with the exception of the last name on the list, F. E. Wyant.

(The motion was seconded and carried.)

DR. MAYO: I move that all be elected except Charles J. Gruber and Winegardner, and F. E. Wyant, who was laid over for further information.

(The motion was seconded and carried.)

DR. MAYO: In Iowa, I. A. Anderson has been laid over for further information. All the others are recommended for election.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

Dr. MAYO: All applicants from Kansas have been recommended for membership by the Executive Board.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: All the applicants in Kentucky have been recommended for membership.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from Louisiana, Maine, Maryland and Massachusetts have been recommended for membership by the Executive Board.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All applicants from Michigan with the exception of E. H. Fletcher, whose application has been laid over for further investigation, have been recommended for membership.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: All applicants from Minnesota with the exception of the first one, C. H. Aamoth, and Ira M. Ford, who have been laid on the table for further investigation, were recommended for membership.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: I wish to state that if any of you have any informa-

tion detrimental to any of these names who are proposed you ought to make it known.

All applicants from Mississippi, Missouri and Montana have been recommended for membership by the Executive Board.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: All applicants from Nebraska, with the exception of R. F. Lovell, have been approved, and his name has been laid over for further recommendation.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All applicants from New Hampshire and New Jersey have been recommended for membership.

DR. LOWE: In regard to New Jersey, I move you, sir, the election of the men whose names have been favorably recommended.

(The motion was seconded and carried.)

DR. KINSLEY: I move the approval of two applicants from New Hampshire.

(The motion was seconded and carried.)

DR. MAYO: All applicants from New York, excepting W. J. Chynoweth, have been recommended for admission and it is recommended that Dr. Chynoweth's name come under the suspension of the rules.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: The applicants from North Carolina have been recommended for admission with the exception of Dr. Flowers and Dr. C. A. Greenig. They are laid over for further information.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. KINSLEY: To be fair to North Carolina, it should be explained that the two names mentioned were short on vouchers.

DR. MAYO: Last year it was the desire of the Association in the case of applicants who were vouched for by army officers and whose applications came in from army camps to get a voucher from applicant's home State, and so far we have not been able to find anyone from North Carolina to vouch for these two men and they have been laid over for that information. Others were in the same shape, but additional vouchers have been secured and I have the names here if you want them.

All the applicants from North Dakota have been approved. Dr. H. P. Roberts was recommended by Dr. White, Dr. Moore and Dr. Mayo.

DR. KINSLEY: I move they be approved.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from Ohio have been recommended with the exception of R. J. Gutermuth of Pittsburg, who was laid over for further information.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: In Oklahoma two applicants, Lewis and Rader, have been recommended, and McElroy is to come under suspension of rules.

DR. KINSLEY: I move approval.

(The motion was seconded and carried.)

DR. MAYO: All the applications from Oregon have been approved and recommended for admission.

DR. KINSLEY: I move they be approved.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from Pennsylvania have been recommended for membership. Dr. Marshall has vouched for Dr. Hutchins and Dr. Martin.

DR. KINSLEY: I move they be approved.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from South Carolina except S. A. Richardson have been recommended for admission to membership.

DR. KINSLEY: What is the recommendation on him?

DR. MAYO: We recommend that he be rejected.

DR. KINSLEY: I move the recommendations be approved.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, and Washington have been recommended for admission to membership in this Association.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: The applicants from West Virginia and Wisconsin have been recommended for membership. Dr. Fletcher, Dr. Hart and Dr. Knapstein have been vouched for by Dr. Eliason in addition to those here.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: All from Wyoming, Alaska and Canada have been recommended with the exception of Dr. Ungar of Canada, and it is recommended that he be elected under suspension of rules.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from the Philippine Islands and an applicant each from London and France have been recommended for admission.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: The 1919 men will have to be admitted under a suspension of the rules, and they have been recommended by the Executive Board. They are on the first page, Beckham and Redmond; Chynoweth under New York, C. J. Miller from Georgia, McElroy from Oklahoma, Ungar from Canada, and Dr. Bray and Dr. Hamner.

(It was moved and seconded that these men who graduated in 1919 he elected under the suspension of the rules. The motion was carried.)

DR. MAYO: The following applications that came in too late to be included in the regular list have been acted upon by the Executive Board.

(Dr. Mayo read the list.)

DR. MAYO: The Executive Board has recommended that all of these with the exception of W. S. Dodge and T. W. Atkinson be accepted.

(It was moved that the recommendation be approved, and the motion was seconded and carried.)

DR. KINSLEY: Mr. President, if it is in order, I should like to move a reconsideration of the vote on the Ohio list.

(The motion was seconded by Dr. Bennett and carried.)

DR. KINSLEY: Mr. President, I move you the list as recommended be accepted with the exception of A. C. Dunlap in addition to Gutermuth.

DR. BAKER: In regard to Dunlap, concerning his affiliations and graduation from the Western, we have members elected who are graduates of that school, who are properly vouched for. Considering that Western is a defunct school, I would like to recommend that if he can be properly vouched for by people who know him he be accepted on his personality.

COL. L. A. MERILLAT: I move that this matter be laid over until Dr. Planter, who is here at the meeting, is consulted. I move to amend the motion.

DR. MAYO: It would seem to me it would be better to refer these two names back to the Executive Board and approve the rest of them.

COL. MERILLAT: I am willing to withdraw my motion.

THE PRESIDENT: The question is that these names from Ohio be voted upon, including the one laid over before and excluding the name of Dr. Dunlap.

(It was moved, seconded and carried that all of the candidates from Ohio, with the exception of the three, Alspach, Dunlap and Gutermuth, be elected.)

DR. MAYO: I have another matter to present. Charges have been preferred against a member, Dr. W. D. James of Martinsville, Ill., and the Executive Board recommends that he be expelled from the Association.

DR. KINSLEY: I move that the recommendation be approved.

(The motion was seconded.)

DR. HOSKINS: I would like to ask what are the charges?

(Dr. Mayo read the charges.)

(The motion was carried.)

THE PRESIDENT: That completes the business as recommended by the Executive Board up to this time. The next order will be the report of the Secretary.

(The Secretary read his report, which follows.)

REPORT OF THE SECRETARY

The past year has been a prosperous one for this Association, although there has been an extensive movement of members, due largely to demobilization of army forces. There has also been a very marked development of local and State veterinary associations. Many new associations have been organized and those already established have had an increased attendance. There has also been a decided increase in public interest in the whole field of veterinary science and particularly along educational lines.

The year has been a busy one for the Secretary's office. On taking over the office it was necessary to arrange and systematize the work. In addition to this the membership was increased nearly 40 per cent by the addition of over 1,000 new members. For these, ledger records had to be made. The frequent changes of addresses of members, particularly those in the army service, has also added to the work. All changes of addresses have been made on the Secretary's records and a notice has also been promptly sent to the Editor of THE JOURNAL of the Association. In addition to the alphabetical ledger index of Association members, a card index of members by States has been made. This was necessary in order to take postal-card votes. On account of a rearrangement of districts it was necessary to take a postal-card vote for nomination and election of members of the Executive Board for Districts Nos. 2 and 3. Dr. T. E. Munce was elected in District No. 2 and Dr. S. E. Bennett in District No. 3.

There are at present 3,470 active members of this Association. During the past year 153 members have been dropped for nonpayment of dues. It is probable that a number of these will be reinstated. Sixteen members have been reinstated and 16 have tendered their resignations. During the year 48 members have died. The number of new applications for membership is 792.

While the work of the Secretary's office has increased, I am pleased to report that the expense has been less than for several previous years. This is largely due to the availability of the equipment of a large business office that has been utilized without cost to the Association. The expenses of the Secretary's office other than the Secretary's salary may be classified as follows:

Clerical help	$582.21
Printing and stationery	375.20
Postage	433.17
Traveling expenses	73.71
Miscellaneous	165.55

More than 20,000 pieces of first-class mail have been sent out from the Secretary's office.

A change was made in the method of handling the money received by the Secretary. Formerly it was the practice to forward all checks, drafts, money orders and cash to the Treasurer every month. In many instances, particularly among the army veterinary officers who

were moving frequently, bank accounts had been closed and checks were returned unpaid, causing increased work to the Secretary's and the Treasurer's offices. Now all funds are deposited immediately by the Secretary in a local bank for collection and a remittance is made to the Treasurer every month. From September 1, 1918, to November 1, 1919, the Secretary has received from all sources and sent to the Treasurer $27,592.48. Of this amount $3,713.45 was collected and entered by the former Acting Secretary. The balance amounting to $23,579.03, mostly in remittances of $5 and $10, was handled by the present Secretary.

Vouchers to the total amount of $14,559.86 have been drawn on the Treasurer. Of this amount $2,500 was sent to Prof. Vallée from the Veterinary Relief Fund, and $500 from the same fund was placed at the disposal of the Veterinary Relief Committee. One voucher for $293.04 was for funds belonging to the Salmon Memorial Fund that had been deposited with the Treasurer of the A. V. M. A. by mistake. The sum of $5,873.76 was invested in United States and Canadian Government bonds, and a revolving fund of $200 for the Secretary's office is to be returned. Subtracting these items, the net expense of the Association for the 14 months is $5,486.10, the net receipts from the Secretary's office being $22,399.39. This does not include the JOURNAL funds of the Association.

The Secretary has had an opportunity of attending quite a large number of veterinary association meetings without expense to the Association, and in all cases the advantage of joining the A. V. M. A. and advancing the interests of the profession has been presented with good results. One trip to the meeting of the Southeastern Veterinary Association was at the request of President Moore, and with the approval of the Executive Board was made at the expense of the A. V. M. A.

The importance of having an official representative of the A. V. M. A. attend veterinary meetings has been presented to this Association previously. This Association should use every means to encourage and stimulate the organization and development of State and local veterinary associations, for it is largely through these that progress in all lines can be best obtained. Many of the smaller associations need such assistance and this offers an excellent field for constructive work by this Association.

At present there is no official connection between the A. V. M. A. and State or local associations. It would seem that a method could be devised by means of which some official connection could be established that would be mutually helpful and increase the efficiency of both for the advancement of the interests of the profession as a whole. I would recommend that a special committee be appointed to consider this subject and report at the next meeting of the Association.

A question has been raised by members of this Association who are practitioners regarding Section 7 of the Code of Ethics that

prohibits members for contracting with live-stock insurance companies for the treatment of live stock insured by them. This class of veterinary work is becoming important in some sections of the country and it is claimed that a member of this Association is placed at a disadvantage. The subject should be given your careful consideration.

Dr. J. V. Newton of Ohio has suggested the adoption of an official emblem for the A. V. M. A. that may be used on stationery of members who are in good standing, the printed stationery to be supplied by the Secretary's office at cost. This idea appears to be an excellent one. Some members are unwittingly using illustrated stationery and bill heads of doubtful propriety. The adoption of a neat Association emblem would do much to establish an ethical standard in this line. Such an emblem might also be used as a pin. I recommend that this be considered by the Association.

There were over 2,100 veterinarians in the army service, a large majority of whom were members of the A. V. M. A. The military record of every member of this Association should be sent to the Secretary's office so that it can be entered as part of the permanent records of this Association. This is important and the value will increase as time passes.

There are a number of minor changes that should be made in the Constitution and By-Laws of this Association to make them better adapted to the needs of the Association, and I would recommend that a committee be appointed for this purpose.

A well-organized effort is being made through State legislatures to secure the passage of laws that will prohibit veterinarians as well as physicians from dispensing medicines. This is a matter of much importance, particularly to veterinarians with a country practice, and I would urge this Association through the Legislative Committee to watch carefully for State legislation that is inimical to the interests of the veterinary practitioner.

I wish to express my thanks for the cordial assistance of the officers, Editor of THE JOURNAL, committee members and resident secretaries. The chairmen and secretaries for the sections on Practice and Sanitary Science and Police have arranged for most of the excellent program that is offered at this meeting. I also want to acknowledge the efficient services of my secretary, Miss Apeland, who has looked after all the details of the Secretary's office and handled all the funds. The books have been neatly and accurately kept.

Respectfully submitted, N. S. MAYO, *Secretary.*

THE PRESIDENT: You have heard the report of the Secretary. I think it is customary that this should be referred to the Executive Board.

DR. KINSLEY: I move that we receive the report of the Secretary.

DR. HOSKINS: As Treasurer of the Auxiliary League Fund, I would like to make some corrections there. That motion was that

$500 be put in the hands of Dr. Smith, so he wouldn't have to go down into his personal funds for expenses.

DR. MAYO: It was placed at his disposal.

DR. HOSKINS: That was the Veterinary Relief Organization.

(Dr. Kinsley's motion was put and carried.)

REPORT OF THE TREASURER

THE PRESIDENT: The next item is the report of the Treasurer, Dr. Jacob.

DR. JACOB: The Treasurer's report has been prepared in pamphlet form and I presume is in the hands of most of you and is self-explanatory.

(The Treasurer's report follows.)

Receipts from September 7, 1918, to November 4, 1919

1918			
Sept.	7	From F. H. Schneider, A. V. M. A. Fund	$ 6,051 08
Sept.	7	From F. H. Schneider, Journal Fund	5,611 61
Sept.	7	From F. H. Schneider, Relief Fund	5,176 94
Sept.	11	From N. S. Mayo, Secretary, A. V. M. A. and Journal Fund	938 15
Sept.	11	From N. S. Mayo, Secretary, A. V. M. A. and Journal Fund	1,490 00
Sept.	11	From N. S. Mayo, Secretary, A. V. M. A. and Journal Fund	1,285 30
Sept.	11	From P. A. Fish. Journal	405 63
Sept.	11	From T. E. Smith, Relief Fund	235 00
Sept.	21	From N. S. Mayo, A. V. M. A. and Journal Fund	1,247 00
Sept.	21	From N. S. Mayo, A. V. M. A. and Journal Fund	5 00
Nov.	1	From N. S. Mayo, Corrected Checks and Money Orders	25 00
Nov.	15	From W. H. Dalrymple, Journal Fund	67 91
Nov.	18	From N. S. Mayo, A. V. M. A. and Journal Fund	1,493 47
Oct.	18	From N. S. Mayo, A. V. M. A. and Journal Fund	1,358 25
Nov.	30	From T. E. Smith, Relief Fund	100 00
Dec.	18	From N. S. Mayo, A. V. M. A. and Journal Fund	602 45
Dec.	18	From W. H. Dalrymple, Journal Fund	101 78
Dec.	31	From T. E. Smith, Relief Fund	75 00
1919			
Jan.	6	From City National Bank, interest on $7,000 for 60 days	70 00
Jan.	18	From N. S. Mayo, A. V. M. A. and Journal Fund	3,204 57
Feb.	4	From W. H. Dalrymple, Journal Fund	754 88
Feb.	4	From T. E. Smith, Relief Fund	29 00
Feb.	18	From N. S. Mayo, A. V. M. A. and Journal Fund	1,620 78
Feb.	18	From C. E. Hayden, Salmon Memorial Fund	268 01
March	5	From W. H. Dalrymple, Journal Fund	314 44
March	17	From N. S. Mayo, A. V. M. A. and Journal Fund	229 00
March	17	From S. H. Gage, Salmon Memorial Fund	25 00
April	5	From W. H. Dalrymple, Journal Fund	314 33
April	17	From N. S. Mayo, A. V. M. A. and Journal Fund	700 50
May	3	From W. H. Dalrymple, Journal Fund	1,366 10
May	20	From N. S. Mayo, A. V. M. A. and Journal Fund	706 90
June	10	From City National Bank, interest on $7,000 Journal Fund	186 69
June	21	From W. H. Dalrymple, Journal Fund	602 67
June	22	From N. S. Mayo, A. V. M. A. and Journal Fund	620 16
July	19	From T. E. Smith, Relief Fund	50 00

July	4	From N. S. Mayo, A. V. M. A. and Journal Fund.	289 50
Aug.	20	From W. H. Dalrymple, Journal Fund	733 67
Aug.	22	From N. S. Mayo, A. V. M. A. and Journal Fund.	466 50
Sept.	18	From N. S. Mayo, A. V. M. A. and Journal Fund.	692 00
Oct.	18	From N. S. Mayo, A. V. M. A. and Journal Fund.	6,890 35
Oct.	20	From City National Bank, interest on $1,000 Relief Fund	40 00
Nov.	1	From Dividends on Dominion of Canada Bonds	150 00
Nov.	1	From Dividends on U. S. Government Bonds	102 90
		Total Receipts	$ 46,697 52
		Less checks deposited but returned uncollected	52 00
		Net Receipts	$ 46,645 52
		Total Expenditures	29,485 50
		Balance cash on hand	$ 17,160 02
		Dominion of Canada Bonds on hand $ 3,023 20*	
		U. S. Liberty Bonds on hand $ 2,850 00*	5,873 20
		Total	$ 23,033 22

*Purchase price.

RECAPITULATION

Journal Fund

Receipts	$ 22,366 15	
Expenditures	17,257 22	
Balance	$ 5,108 93	
Liberty Bonds	2,850 00	
		$ 7,958 93

Association Fund

Receipts:	$ 18,573 43	
Expenditures	9,225 82	
Balance	$ 9,347 61	
Canada Bonds	3,023 20	
		$ 12,370 81

Relief Fund

Receipts	$ 5,705 94	
Expenditures	3,002 46	
Balance		$ 2,703 48
Total balance cash and bonds on hand		$ 23,033 22

EXPENDITURES

Association Fund

1918			
Sept.	21	American Surety Co. of N. Y., premium on bond for N. S. Mayo as Secretary	$ 12 50
Sept.	21	H. Preston Hoskins, expenses as Secretary of the Section on Sanitary Science and Police	6 25
Sept.	21	P. A. Fish, salary for August, 1918	125 00
Sept.	21	Jas. G. Jervis, expenses as Provincial Secretary for B. C., during 1917 and 1918	1 81
Sept.	21	A. S. Cooley, expenses as Ohio State Secretary	5 00

Sept.	21	The Ravenswood Press, printing stationery	63 75
Sept.	21	P. A. Fish, office assistant for August	60 00
Sept.	21	F. H. Schneider, one-half of office expenses	20 83
Sept.	21	Julian Grayson, auditing Secretary's accounts	30 00
Sept.	21	F. Torrance, expenses President's office, 1917-1918	28 74
Sept.	21	Milton J. Ernest, refund of application fee	10 00
Sept.	21	Percy Graham, refund of application fee	10 00
Sept.	21	W. P. Kelty, refund of application fee	10 00
Sept.	21	T. W. Stewart, refund of application fee	10 00
Sept.	21	Wm. B. Casilear, refund of application fee	10 00
Sept.	21	Claude E. Thompson, refund of application fee	10 00
Sept.	21	Jos. C. Mitchell, refund of application fee	10 00
Sept.	21	J. F. Kagey, refund of application fee	10 00
Sept.	21	Thos. J. Ahern, refund of application fee	10 00
Sept.	21	H. M. Clarvoe, refund of application fee	10 00
Sept.	21	Wm. G. Saunders, refund of application fee	10 00
Sept.	21	Adrain A. Martin, refund of application fee	10 00
Sept.	21	Danl. W. McCallum, refund of application fee	10 00
Sept.	21	E. B. Simonds, refund of application fee	10 00
Sept.	21	E. V. Fenton, refund of application fee	10 00
Sept.	21	Robt. P. Huffman, refund of application fee	10 00
Sept.	21	M. V. Wilmot, refund of application fee	10 00
Sept.	21	L. Enos Day, expenses of Secretary's office, August	447 10
Sept.	21	Wm. A. Carter, refund of application fee	10 00
Oct.	14	The Ravenswood Press, letterheads and envelopes	7 45
Oct.	14	N. S. Mayo, salary as Secretary for September, 1918	100 00
Oct.	14	The Ravenswood Press, printing postal cards	9 85
Oct.	14	The Workman Mfg. Co., printing	22 25
Oct.	14	W. H. Martin, transcript of proceedings of 55th annual meeting of A. V. M. A. and incidental expenses	165 00
Oct.	14	N. S. Mayo, expenses of Secretary's office for September	194 96
Oct.	14	H. E. Hosbach, auditing books of Treasurer's office	25 00
Oct.	14	F. H. Schneider, expenses of Treasurer's office for June, July and August	61 50
Oct.	14	M. J. Belton, refund of initiation fee	5 00
Oct.	25	W. Horace Hoskins, expenses on Western trip	159 78
Oct.	25	The Cayuga Press, printing stationery	12 50
Nov.	23	The Modern Press, printing 1,000 membership cards	8 50
Nov.	23	W. H. Hoskins, wreath of flowers for Dr. Gill	10 00
Nov.	23	The Modern Press, printing cards	8 50
Nov.	23	Library Bureau, filing case	28 75
Nov.	23	The Ravenswood Press, printing card ballots	10 85
Nov.	23	Bean, Warters & Co., books and files for M. Jacob	2 35
Nov.	23	N. S. Mayo, expenses of Secretary's office for October	128 40
Nov.	23	N. S. Mayo, salary as Secretary	100 00
Dec.	21	V. A. Moore, President's office expenses	14 00
Dec.	21	Cassius Way, expenses inspecting veterinary colleges for Committee on Intelligence and Education	36 79
Dec.	21	Addressograph Company	7 75
Dec.	21	N. S. Mayo, salary for November, 1918	100 00
Dec.	21	N. S. Mayo, revolving fund for expenses	200 00
Dec.	21	N. S. Mayo, expenses Secretary's office for November	85 45
Dec.	21	The Ravenswood Press, printing stationery	20 75
Dec.	31	N. S. Mayo, salary for December, 1918	100 00
1919			
Jan.	6	N. S. Mayo, expenses Secretary's office for December	83 04

Jan.	6	Doll & Mynderse Co., premium on Treasurer's bond	35 00
Jan.	6	The Ravenswood Press, printing letterheads	74 75
Jan.	6	The Ravenswood Press, printing application for membership	24 75
Jan.	6	The Ravenswood Press, printing letterheads and envelopes	46 50
Jan.	6	Mrs. H. R. Millard, refund of dues of H. R. Millard	5 00
Jan.	22	G. H. Smith, clerical services	2 50
Jan.	22	Commercial Stationery and Loose Leaf Co., office equipment	6 76
Feb.	10	The Ravenswood Press, printing envelopes	89 00
Feb.	10	N. S. Mayo, salary for January	100 00
Feb.	10	N. S. Mayo, expenses of Secretary's office for January	70 57
Feb.	18	Wayne Alter, balance refund on application	2 00
March	8	N. S. Mayo, salary for February	100 00
March	8	O. A. Longley, refund on application of E. L. Blumenshine	5 00
March	8	N. S. Mayo, expenses of Secretary's office for February	35 80
March	8	N. S. Mayo	73 71
March	8	The Underwood Typewriter Co., typewriter	70 00
March	15	City National Bank, Dominion of Canada Bonds	3,023 20
March	17	V. A. Moore, office expenses for President	10 78
March	17	The Ravenswood Press, printing envelopes, etc	7 15
April	7	N. S. Mayo, salary for March	100 00
April	7	N. S. Mayo, expenses of Secretary for March	59 00
April	18	The Modern Press, printing membership cards	25 00
April	18	E. J. Sieburg, refund on application	3 75
April	18	H. S. Murphey, report of Committee on Anatomical Nomenclature	42 28
May	3	H. D. Bergman, expenses inspection trip representing Committee on Intelligence and Education	86 03
May	3	N. S. Mayo, salary for April	100 00
May	3	N. S. Mayo, expenses Secretary's office for April	45 36
May	20	W. Horace Hoskins, expenses Salmon Memorial Committee	16 08
May	20	S. J. Walkley, expenses Committee on Legilsation	157 60
May	20	W. Horace Hoskins, expenses Committee on Legislation	118 79
May	20	Geo. W. Dunphy, expenses inspecting veterinary colleges	52 90
May	20	T. E. Munce, expenses on Committee on Legislation	14 18
June	3	The Ravenswood Press, printing voucher blanks	6 50
June	3	Cassius Way, expenses in connection Committee on Intelligence and Education	100 62
June	3	Geo. H. Hart, expenses in connection Committee on Intelligence and Education	132 80
June	10	The Ravenswood Press, letterheads and envelopes	16 00
June	10	N. S. Mayo, salary for May	100 00
June	10	N. S. Mayo, expenses Secretary's office for May	41 02
June	23	Louis A. Klein, expenses attending of American Association of Pharmaceutical Chemists	15 24
June	23	G. H. Roberts, postage as Resident Secretary	19 50
June	23	V. A. Moore, expenses of President's office	7 65
July	8	N. S. Mayo, salary for June	100 00
July	8	N. S. Mayo, expenses Secretary's office for June	25 92
July	8	The Ravenswood Press, printing application blanks	8 75
July	15	W. Horace Hoskins, expenses Legislation Committee	29 21
July	15	W. Horace Hoskins, expenses Salmon Memorial Fund	3 46

July	15	S. J. Walkley, expenses Committee of Legislation..	56 34
July	21	C. H. Noffinger, refund on rejected application....	4 00
July	21	Jas. T. Seely, expenses as Resident Secretary.....	3 00
July	21	The Ravenswood Press, printing letterheads and envelopes.....	7 00
Aug.	11	N. S. Mayo, salary for July.....	100 00
Aug.	11	N. S. Mayo, expenses of Secretary's office for July..	35 68
Aug.	11	The Ravenswood Press, printing stationery.....	78 00
Aug.	30	W. Horace Hoskins, expenses Legislation Committee.....	53 79
Aug.	30	S. J. Walkley, expenses Legislation Committee....	21 90
Sept.	6	N. S. Mayo, expenses Secretary's office for August.	126 29
Sept.	6	N. S. Mayo, salary for August.....	100 00
Sept.	6	W. Horace Hoskins, account Salmon Memorial Fund.....	293 01
Sept.	6	The Ravenswood Press, printing stationery.....	7 50
Sept.	19	S. J. Walkley, expenses Committee on Legislation.	24 20
Sept.	19	V. A. Moore, office expenses as President.....	15 07
Sept.	19	W. Horace Hoskins, postage Salmon Memorial Fund.....	3 14
Sept.	27	E. I. Smith, expenses as Resident Secretary.....	4 12
Sept.	27	The Ravenswood Press, printing envelopes.....	13 50
Oct.	9	N. S. Mayo, expenses Secretary's office for September.....	98 72
Oct.	9	A. M. Wright, refund on application and dues....	16 00
Oct.	9	The Ravenswood Press, printing stationery.....	27 50
Oct.	9	N. S. Mayo, salary for September.....	100 00
Oct.	9	M. B. Mertens, refund on application.....	3 00
Oct.	9	American Surety Co. of N. Y., surety bond of N. S. Mayo.....	12 50
Oct.	20	Doll & Mynderse Co., premium on Treasurer's bond.....	35 00
Oct.	20	S. J. Walkley, expenses Committee on Legislation.	30 90
Oct.	20	Bonsley, Florist, wreath flowers for Harry Moore..	20 00
Oct.	25	The Ravenswood Press, printing 1,000 application blanks.....	7 50
Oct.	25	The Ravenswood Press, printing cards.....	24 85
Oct.	31	John S. Grove, expenses Resident Secretary's office.	3 80
			$ 9,225 82

EXPENDITURES

Journal Fund

1918			
Oct.	14	H. J. Bool Co., packing and drayage on material in connection with transfer to Baton Rouge, La....	79 12
Oct.	14	P. A. Fish, work in connection with above transfer.	30 00
Oct.	14	Norton Printing Co., printing September issue....	633 08
Oct.	25	Ramires-Jones Printing Co., printing Journal and stationery.....	605 40
Oct.	25	Miss Byrne Monget, salary for September.....	60 00
Oct.	25	W. H. Dalrymple, salary for September.....	125 00
Oct.	25	Bigelow Binder Co., June account.....	1 95
Nov.	23	Miss Byrne Monget, salary for October.....	60 00
Nov.	23	W. H. Dalrymple, salary for October.....	125 00
Nov.	23	Ramires-Jones Printing Co., printing Journal.....	721 64
Dec.	21	J. B. Kroger & Son, shelves.....	14 40
Dec.	21	W. H. Dalrymple, expenses attending Executive Board.....	110 08
Dec.	21	W. H. Dalrymple, salary for November.....	125 00
Dec.	21	Miss Byrne Monget, salary for November.....	60 00
Dec.	21	J. K. Roumain, typewriter table and chair.....	4 00
Dec.	21	J. K. Roumain, office rent.....	28 00

Dec.	21	Ramires-Jones Printing Co., printing Journal for December	616 72
1919			
Jan.	21	W. S. Hall for purchase of $3,000 in Liberty Bonds	2,850 00
Jan.	22	Miss Byrne Monget, salary for December	60 00
Jan.	22	W. H. Dalrymple, salary for December	125 00
Jan.	22	J. K. Roumain, rent of office and storeroom for December	28 00
Jan.	22	Ramires-Jones Printing Co., printing December Journal, etc	716 00
Feb.	18	W. H. Dalrymple, subscription for Journal for W. Alter	3 00
Feb.	18	W. H. Dalrymple, salary for January	125 00
Feb.	18	Miss Byrne Monget, salary for January	60 00
Feb.	18	Ramires-Jones Printing Co., printing 4,500 copies extra edition of January number	772 60
Feb.	18	Bigelow Binder Co., binders	14 50
Feb.	18	J. K. Roumain, rent of office and storeroom	28 00
March	8	Addressograph Co., purchases for December and January	18 63
March	8	Ramires-Jones Printing Co., printing stationery	4 00
March	8	Ramires-Jones Printing Co., printing February number	670 50
March	17	J. K. Roumain, rent of office and storeroom	28 00
March	17	Ortlieb-Ranney Printing Co., printing stationery	14 00
March	29	Miss Byrne Monget, salary for February	60 00
March	29	W. H. Dalrymple, salary for February	125 00
March	29	Ramires-Jones Printing Co., printing November number	721 75
March	29	Addressograph Co., stencils furnished	6 38
April	18	J. K. Roumain, rent of office and storeroom	28 00
April	18	J. E. Ortlieb Printing Co., printing stationery	9 00
April	18	Ramires-Jones Printing Co., printing Journal	764 82
April	18	W. H. Dalrymple, salary for March	125 00
April	18	Miss Byrne Monget, salary for March	60 00
May	3	National Blank Book Co., binders	34 58
May	20	Addressograph Co., May account	6 55
May	20	Ramires Jones Printing Co., printing May Journal	846 85
May	20	Miss Byrne Monget, salary for April	60 00
May	20	J. K. Roumain, rent of office and storeroom	28 00
May	20	W. H. Dalrymple, salary for April	125 00
June	23	W. H. Dalrymple, salary for May	125 00
June	23	Ramires-Jones Co., printing June Journal	838 55
June	23	J. K. Roumain, rent of office and storeroom	28 00
June	23	Miss Byrne Monget, salary for May	60 00
July	8	Addressograph Co., stencils	5 05
July	15	Ramires-Jones Printing Co., printing July Journal	780 24
July	15	J. K. Roumain, rent of office and storeroom	28 00
July	15	Miss Byrne Monget, salary for June	60 00
July	15	W. H. Dalrymple, salary for June	125 00
Aug.	20	W. H. Dalrymple, salary for July	125 00
Aug.	20	Miss Byrne Monget, salary for July	60 00
Aug.	20	J. K. Roumain, rent of office and storeroom	28 00
Aug.	20	Ramires-Jones Printing Co., printing August Journal	840 67
Sept.	9	J. K. Roumain, rent of office and storeroom	28 00
Sept.	19	W. H. Dalrymple, salary for August	125 00
Sept.	19	Miss Byrne Monget, salary for August	60 00
Sept.	19	Ramires-Jones Printing Co., printing September Journal	905 88
Sept.	27	The Addressograph Co., stencils	7 11
Oct.	25	J. K. Roumain, rent of office and storeroom	35 00

Oct.	25	The Addressograph Co., September account	7 18
Oct.	25	J. E. Ortlieb, printing 400 postal cards	7 00
Oct.	25	Miss Byrne Monget, salary for September	60 00
Oct.	25	W. H. Dalrymple, salary for September	125 00
Oct.	25	Ramires-Jones Printing Co., printing October Journal	845 99
			$ 17,257 22

EXPENDITURES

Relief Fund

1918			
Dec.	28	Mrs. W. Horace Hoskins, Treasurer Auxiliary Relief Fund	$ 500 00
1919			
April	1	City National Bank to be forwarded to Prof. H. Vallée	2,502 46
			$ 3,002 46

Knoxville, Tenn., November 4, 1919

Dr. M. Jacob, Treasurer,
American Veterinary Medical Association,
Knoxville, Tennessee.

Dear Sir:—

We enclose herewith cancelled checks and statements of the balances as of this date in the following accounts:

American Veterinary Medical Association	$ 7,364 03
Journal Fund	8,334 23
Relief Fund	1,693 48

Yours truly,

THE CITY NATIONAL BANK,
R. E. MOONEY, Vice-Pres.

THE PRESIDENT: You have heard the report. What is your pleasure?

DR. HOSKINS: The same correction ought to be made there that was in the Secretary's report—about the $500.

THE PRESIDENT: It will be referred to the Auditing Committee.

DR. MAYO: Mr. President, I have some more applications that have been approved and recommended for election by the Executive Board, and I will read them.

(Dr. Mayo read the list.)

DR. HOSKINS: I move the recommendation be approved.

(The motion was seconded and carried.)

REPORTS OF COMMITTEES

THE PRESIDENT: The next item on the program is the report of the Editor. That, I believe, goes to the Executive Board. The next is the reports of committees. The first committee is that on Intelligence and Education. Dr. George W. Dunphy, Chairman, not being present, the matter will be laid over until later. The next is the report of the Committee on Legislation.

DR. HOSKINS: That will have to be laid over.

THE PRESIDENT: Next is the Committee on Resolutions, which I think of necessity will be laid over. The next is the Audit Committee, Dr. Ryder, Chairman.

DR. H. R. RYDER (Chicago): The Committee is not ready to report yet.

THE PRESIDENT: Committee on Necrology, Dr. Conway.

(The Committee was not ready to report.)

THE PRESIDENT: The Committee on History, Dr. R. C. Moore.

DR. R. C. MOORE (St. Joseph, Mo.): The Committee would like to have a little more time.

THE PRESIDENT: Next is the Committee on Anatomical Nomenclature, Dr. Murphey, Chairman.

DR. MURPHEY (Ames, Iowa): Mr. President and Members of the Association, I believe it would be advisable to read simply a letter and not a list of terms.

The Committee on Anatomical Nomenclature reports for the year 1919 as follows:

1. We are submitting the second list of terms which, with the first list published in the 1913 proceedings, have been submitted to and accepted by the veterinary anatomists of North America. The lists of terms are considered a part of this report.

2. We move their adoption and publication by this Association.

3. We move that the Committee be continued to prepare and submit a table of suggested English equivalents together with such additions and corrections as are necessary to conform to the lists of the American Association of Anatomists; and that the Committee be directed to cooperate with the veterinary anatomists of other English-speaking countries in the preparation of said lists of anatomical terms.

4. We urge and advise the general adoption of these terms for all branches of veterinary medicine in the interest of brevity, uniformity and clearness.

H. S. MURPHEY,
F. W. CHAMBERLAIN,
MARK FRANCIS.

DR. W. H. HOSKINS: I move it be received and referred to the Executive Board for action.

DR. MURPHEY: Mr. President, I believe the committee felt that it was their prerogative to move the adoption. We did so move.

(The motion was seconded by Dr. Wm. Herbert Lowe.)

DR. MURPHEY: The committee moved the adoption and acceptance of this report as one part, and as a second part further cooperation with the American Association of Anatomists in the final preparation of the list. Explanatory to this, I might say, that we feel that inasmuch as the Association started this work originally, and that as the lists are finally submitted, they ought to be approved, but subject to minor corrections to conform to a list which is in preparation on the whole matter of human and comparative anatomy.

THE PRESIDENT: The chairman of the committee feels, as I understand the question, that this report should be adopted or rejected and not merely received.

DR. W. H. HOSKINS: The chairman doesn't read anything but the transcript of the report; he fails to tell us the changes. It seems to me the Executive Board could come to some conclusion after the examination.

DR. MURPHEY: I believe I have the first motion before the house in presenting this report. I believe that the second motion is out of order.

THE PRESIDENT: Did the chairman of the committee make a motion?

DR. MURPHEY: The first thing was that we move the adoption and publication by the Association.

(Dr. Murphey's motion was seconded and carried.)

DR. CHARLES E. COTTON (Minneapolis, Minn.): I think the members of this body should know that the chairman of this committee has been made a member of the American Association of Anatomists. All other members of that association are human anatomists. They are to revise the nomenclature of all branches of anatomy.

THE PRESIDENT: I think that is a very merited recognition and I am glad it was brought before the members. I believe the Executive Board will undoubtedly make recommendations regarding the disposal of this very elaborate piece of work that has been performed by this committee. Next is the Committee on Army Veterinary Service.

(There was no report from this committee. The Budget Committee was not yet ready to report.)

THE PRESIDENT: The next is the Salmon Memorial Committee, Dr. J. F. Winchester, chairman.

DR. W. H. HOSKINS: The chairman asked me to report for him.

REPORT OF THE SALMON MEMORIAL FUND

This Committee, after a period of quiescence for the past two years, owing to the many war-fund calls and our own Veterinary Relief Fund, resumed its efforts toward the completion of this fund.

The total amount now in hand and subscribed has passed the $5,000 mark, or one-half the amount contemplated by the Committee. Some subscriptions were contingent on this amount being raised.

During the year an amount reaching $293.01 collected from the profession in New York State was placed in the Committee's hands. A balance collected from the Bureau of Animal Industry veterinarians, remaining after the procuring of a beautiful portrait that now hangs on the office wall of the Chief of the Bureau at Washington, amounting to $515.86, was turned over to the Committee. From Minnesota came $55 collected in $1 subscriptions at one of their meetings. Twelve additional subscriptions of $25 each has been added to the list, making the number 41. This list we hope to reach 50 in number.

The expense incurred during the year has not reached $30, which

in accordance with the action of this Association was paid from the funds of the Association, and all subscriptions and interest have gone to the completion of the fund.

The amount received since January 1, 1919, to November 12, inclusive, reaches the sum of $1,299.87. The amount in bank to same date, $4,072.64. About $1,000 pledged, part of this contingently, brings the amount, in round numbers, to $5,000. This will be greatly added to before the expiration of the year, as the plans recently inaugurated to complete this fund attain their fruition.

Respectfully submitted,

W. HORACE HOSKINS, *Sec'y-Treas.*

STATE CONTRIBUTIONS TO SALMON MEMORIAL FUND

New York	$647.07	Virginia	$59.00
District of Columbia	614.86	Missouri	52.00
Iowa	469.61	Tennessee	51.00
Minnesota	236.00	Montana	33.00
Ohio	220.00	California	27.00
Pennsylvania	212.00	Louisiana	25.00
Massachusetts	205.00	Mississippi	20.00
Michigan	194.00	Army Veterinarians	17.00
New Jersey	165.00	Colorado	16.00
Indiana	138.00	Maine	15.00
Illinois	131.00	South Carolina	5.00
Wisconsin	106.00	North Dakota	2.00
Canada	75.25	Georgia	1.00
Connecticut	73.00	Texas	1.00

TWENTY-FIVE DOLLAR SUBSCRIPTIONS TO THE SALMON MEMORIAL FUND

Dr. J. C. Meyer, 1111 Walnut St., Cincinnati, Ohio.
Dr. Lester H. Howard, 187 Huntington Ave., Boston, Mass.
Dr. S. H. Gillilland, Philadelphia, Pa.
Dr. M. N. McKillip, 1639 Wabash Ave., Chicago, Ill.
Dr. Robert W. Ellis, 477 West 150th St., New York City.
Dr. C. J. Marshall, 39th and Woodland Ave., Philadelphia, Pa.
Dr. D. M. Campbell, Chicago, Ill.
Dr. F. J. De Vine, Goshen, N. Y.
Dr. W. H. Dalrymple, Baton Rouge, La.
Dr. C. M. Haring, Berkeley, Calif.
Dr. Samuel Brenton, Detroit, Mich.
Dr. E. B. Ackerman, 215 Washington St., Brooklyn, N. Y.
Dr. Elijah E. Patterson, Detroit, Mich.
Dr. Charles E. Cotton, Minneapolis, Minn.
Dr. J. G. Rutherford, Alberta, Canada.
Dr. John V. Newton, Toledo, Ohio.
Dr. J. T. Claris, Buffalo, N. Y.
Dr. J. F. Winchester, Lawrence, Mass.
Dr. Samuel Brenton, Detroit, Mich. (Second contribution.)
Dr. W. Horace Hoskins, 338 E. 26th St., New York City.
Dr. James Law, Ithaca, N. Y.
Dr. U. G. Houck, B. A. I., Washington, D. C.
Dr. George H. Berns, Brooklyn, N. Y.
Drs. Baker and McClelland, Buffalo, N. Y.
Dr. F. H. Gage, Veterinary Corps of U. S. Army.
Dr. John R. Mohler, B. A. I., Washington, D. C.
Dr. W. G. Hollingworth, Utica, N. Y.
Dr. P. A. Fish, Ithaca, N. Y.
Dr. Otto Faust, Poughkeepsie, N. Y.

Dr. Veranus A. Moore, Ithaca, N. Y.
Dr. A. T. Kinsley, Kansas City, Mo.
Dr. Wm. Herbert Lowe, Paterson, N. J.
Dr. H. Jensen, Kansas City, Mo.
Dr. Fred Torrance, Ottawa, Canada.
Dr. J. W. Scheibler, 271 Court Ave., Memphis, Tenn.
Dr. M. Jacob, Nashville, Tenn.
Dr. L. A. Merillat, Orrville, Ohio.
Dr. Robert S. MacKellar, 351 West 11th St., New York, N. Y.
Dr. H. B. Cox, 1516 Snyder Ave., Philadelphia, Pa.
Dr. Adolph Eichhorn, Pearl River, N. Y.
Drs. McAuslin and McAuslin, Brooklyn, N. Y.

THE PRESIDENT: You have heard the report. What shall be done with it?

DR. MURPHEY: I move we refer it to the Executive Board.

DR. W. H. HOSKINS: Most of the members of the committee are located in this zone, and an effort to get them to work hard has been of no avail. In the West we had another member that has not been active. By the plans which we have now devised and which we are going to carry out in the whole, we ought to be able to accomplish something.

(The motion was seconded and carried.)

THE PRESIDENT: Next is the report on Liautard Memorial, Dr. Ellis to report.

(Dr. Ellis not being present, there was no report.)

THE PRESIDENT: Next is the report of the special Committee on Veterinary Reconstruction Work for the United States, Dr. Mohler, chairman.

DR. J. R. MOHLER (Washington, D. C.): Mr. Chairman, your committee submits the following report. Unfortunately, the correspondence with the other members of the committee failed to produce any reconstructive views and I anticipated meeting a few of them here, but thus far only one member has appeared. Therefore what I am going to say will represent only the chairman's views.

(Dr. Mohler read his report. It will be published later.)

THE PRESIDENT: You have heard this report. What shall we do with it?

DR. KINSLEY: Mr. Chairman, I move you the report be adopted.

(The motion was seconded and carried.)

THE PRESIDENT: The next is the report of the International Committee on Bovine Tuberculosis. There is a little mistake on this program. Dr. Rutherford, who was chairman of this committee, early in the year expressed his inability to perform the duties of that office, but we desired to have him continue as a member, and at his suggestion Dr. J. G. Wills was asked to act as chairman of the committee. Later Dr. Rutherford resigned and Dr. Torrance was appointed in his place. Dr. Wills, however, has acted as chairman of this committee in the preparation of the report. We will hear Dr. Wills.

DR. J. G. WILLS (Albany, N. Y.): Mr. President and members of the Association, owing to but one other member of the committee

so far appearing, except myself, it has not been possible to go over this final report as fully as we would wish. A tentative report was submitted to the members and a final report has been gone over by Dr. Cotton, who is the other member of the committee here, and myself.

REPORT OF COMMITTEE ON BOVINE TUBERCULOSIS

In the preparation of a report on bovine tuberculosis your committee has been confronted with the difficulty of having no specific recommendations or new theories to advance. The vast amount of work done and numerous papers, pamphlets and publications prepared dealing with this subject have so fully covered the ground that there is little new material left for presentation at this time. It was felt, however, that a summary of the progress made since the last report by the International Committee on Bovine Tuberculosis justified our submitting a general report on the situation now existing, with an attempt at gathering together and making comment upon some of the most recent developments.

As a preliminary statement it would appear that the most important advance in recent years in the eradication of bovine tuberculosis is the tuberculosis-free accredited-herd plan. This system has been put in quite general operation in the United States and more recently inaugurated in the Dominion of Canada. It should be stated that the influence which brought about the introduction of this method in the tuberculosis eradication problem are directly traceable to the work done by the International Commission of the American Veterinary Medical Association many years ago. Your committee believes that this plan is based on sound and logical principles and is capable of being developed into a potent force in bringing about the control of tuberculosis in the bovine. It must be conducted in such a way as to secure the hearty cooperation of the cattle owner, the authorities in charge of live-stock sanitary control work, and the veterinary profession. It will not succeed unless scientific principles are followed and the supervision by competent men secured. In the appendix of this report will be found copies of the uniform regulations adopted by the United States and Canadian Governments covering this method. It is understood that these rules will of necessity have to be modified from time to time and that they will not meet all conditions or always receive the unanimous support of all concerned. It is believed that they form the basis for a better organized plan for combating this great plague to the end that success may ultimately be assured.

Your committee feels that it should take a definite position on the question of tuberculin and is warranted in stating that this product forms the principal basis and groundwork for diagnosis of the disease; that the subcutaneous method is the most widely adopted and must be relied upon as the general standard under most conditions. We realize that the ophthalmic and intradermal methods are both of value and under certain conditions may be preferable. In any method adopted for examination of a herd your committee desires to

emphasize the necessity of the work being done by properly trained and equipped men and in such a manner as to insure a maximum of accuracy in every respect.

The careful reading of thermometers, attention to control of the animal as regards feed and water, and taking sufficient temperatures before and after injection of tuberculin are all of the utmost importance if accurate results are to be obtained. Success or failure in the eradication of the disease from the herd is largely a matter of skill on the part of the examiner, coupled with proper equipment and help from the animal owner.

We believe that frequently a combination of several or of all known methods may be of advantage, for the reason that there is a greater probability of infection being detected if several methods are used, providing they do not interfere one with the other.

It should be understood that positive indications of infection shown by any reasonably reliable test should be accepted in preference to the negative manifestations of any other test. In other words, the positive evidences of reaction should outweigh negative evidences under all ordinary conditions.

In the application of any test we wish to emphasize the importance of careful observation of the individual animal while under examination. It is generally conceded that many of the alleged deficiencies of tuberculin have been due to the failure of the examiner to recognize and interpret clinical symptoms in the animal before him. The escape of the so-called "spreaders" from detection by the test is the principal means whereby the disease is enabled to perpetuate itself and has been the means of undoing many attempts at control or eradication.

The examination should be considered from a clinical as well as a physical standpoint. Much valuable data have been lost in the past due to the lack of careful observation of the animal after the administration of tuberculin. A comprehensive study of these phenomena and their comparison with the postmortem results would be of great value in determining the relationship, if any, existing.

The practice of retesting animals that have once definitely reacted should be discouraged as unnecessary and only tending to confusion and misunderstanding.

Your committee views with great regret the tendency on the part of many veterinarians, particularly of the younger generation, to rely upon diagnostic aids, both biologic and mechanical, to the complete exclusion of their own natural senses. The inclination of the examiner to depend entirely upon the artificial aids that he employs, rather than supplementing such aids by his own observation and abilities, has resulted and is resulting disastrously in many cases, with the effect of making the physical diagnosis of this disease an almost forgotten art in the hands of many veterinarians. The mechanical apparatus now at our command has developed a tendency to rely upon such outside aids and to create in the minds of many the erroneous belief that this, a biological problem, may be

solved by the application of mechanical principles. An important objection to carelessness in connection with the physical examination of the animal is the opportunity presented for criticism of the examiner and the efficiency of the means he employs where unsatisfactory developments occur later.

Your committee wishes to point out the necessity of careful investigation and study as to the channels for distribution of tuberculous organisms and consequent opportunity for spread of the disease. It is possible that there are unsuspected means of exposure which require attention. The work of Van Es wherein it has been shown that sparrows serve as distributors of the virus should be considered. The investigations by the Federal station at Bethesda, Md., indicate that mice may have some significance in a similar way. These are important and should be given further attention and study.

It is unfortunate that the cleansing and disinfection of premises where diseased animals have been kept has not received more careful attention in the past, since this is a prolific means of the disease being carried from animal to animal or from herd to herd. It not infrequently happens that after much time and money have been expended in the detection and removal of the reactors the thorough destruction of the virus remaining in stables or premises is almost entirely ignored. The disposal of any and all infected material is essential after the removal of the diseased individuals, if susceptible cattle are later to be placed on such premises. In the past there has been some tendency to lose sight of the importance of rendering the virus outside of the animal itself inert and non-infective.

Your committee feels that there is opportunity for closer cooperation between the medical and veterinary professions in the tuberculosis problem. It is now generally conceded that the possibility of transmission of the germ of the bovine type is limited almost entirely to young children, and likewise generally understood that the danger of transmission of the human type of the germ to the animal is comparatively unimportant. The presence, therefore, of bovine tuberculosis in dairy cattle would seem to be of more importance to the medical profession because of the possibility of transmission of the disease to children than would the presence of human tuberculosis in relation to danger to the animal kingdom. However, since the entire problem bears relationship to the welfare of the human family, the veterinarian must necessarily be concerned with the danger to the human from the organism in the bovine. In a matter of such vital importance it is better to err on the side of safety, and when one realizes the limitations of science so often painfully demonstrated in the past, and the frequent changes in the attitude of scientists following fresh discoveries, there would appear to be full justification for the adoption of all possible precautions to prevent the infection of human beings with bovine tuberculosis. It is believed that much good would come

from more systematic and concentrated effort between the two professions than seems to be the case at the present time.

Your committee feels that it should point out the importance of proper isolation, so far as practicable, of individual cattle, particularly while stabled, by means of individual mangers and drinking and feeding troughs. Attention has been given in human medicine in recent years to the individual drinking cup, and the proper sanitary control of receptacles for feed and drink is a principle entirely applicable to the control of infections in animals. It is of course not possible to carry this isolation to the extent of entirely avoiding contact between individuals or even approaching that ideal. Reducing the opportunity, however, of disease organisms being distributed can not fail to limit the distribution of infection. Repeated evidences of this principle could be given.

The interchange of cattle from State to State, from county to county and even from herd to herd is a fertile means for the distribution of infection. It is possible that in time more drastic control of such traffic will be necessary, and your committee believes that this Association should through its membership or even by resolution point out and prepare those interested for more severe restrictions on interchange of such animals. The prohibition against disposition except for slaughter of cattle coming from herds in which the percentage of reactors has reached dangerous proportions would have an important effect in reducing the distribution of disease by such interchange. The custom which at present generally prevails of allowing the distribution of animals without restraint except a health certificate issued on the basis of the conditions found in the individual animal is far from affording the protection that such a certificate is commonly accepted as carrying.

In other words, the practice of breeders and dealers of testing only the animals which they sell and of disposing of those that pass satisfactory test, irrespective of the percentage of infection known or unknown to exist in the herd, offers no definite assurance that the individual examined is not carrying the germs of disease in its system. The frequency with which animals purchased under such conditions are the means of carrying infection into healthy herds is sufficient evidence of the fallacy of such a procedure.

At the present time the tendency to require pasteurization of milk would seem to offer some hope as a means of insuring healthy young stock to take the place of diseased ancestors. Your committee believes that continued effort should be made to impress upon cattle owners the importance of the pasteurization of skim milk prior to its being used for the feeding of calves or hogs. There are countless instances on record where contaminated milk by-products have been the means of distribution of infectious diseases in communities where the practice prevails of distributing unpasteurized skim milk from public creameries or skimming stations.

We believe that the tendency in the past to place the great stress on the destruction of the diseased individual with lack of attention

to the other sources of infection has been one reason for lack of progress in eradication. When it is recognized by cattle owners and others interested that the protection of the individual, particularly while young, from exposure to infection is the most efficient method of control, we will then have made an important point in the fight against this great plague. It would seem that the protection of the younger generation from exposure to disease distributed by older animals offers the best possible weapon in controlling and eradicating bovine tuberculosis.

Your committee suggests consideration as to the advisibility of continuing this committee. In the absence of new developments or of radical departures from established methods little remains to report except progress from year to year.

J. G. WILLS,
CHARLES E. COTTON.

APPENDIX TO REPORT OF COMMITTEE ON BOVINE TUBERCULOSIS

THE UNITED STATES PLAN

Uniform methods and rules for tuberculosis-free accredited herds of purebred cattle, as adopted by the United States Live Stock Sanitary Association and by representatives of purebred cattle breeders' associations and approved by the United States Bureau of Animal Industry.

1. A tuberculosis-free accredited purebred herd is one which has been tuberculin tested by the subcutaneous method, or any other test approved by the Bureau of Animal Industry, under the supervision of the Bureau of Animal Industry, or regularly employed veterinary inspector of the State in which cooperative tuberculosis eradication work is being conducted jointly by the United States Department of Agriculture and the State. Further, it shall be a herd in which no animal affected with tuberculosis has been found upon two annual or three semiannual tuberculin tests, as above described, and by physical examination.

2. The entire herd, or any cattle in the herd, shall be tuberculin tested or retested at such time as is considered necessary by the Federal and State authorities.

3. No cattle shall be presented for the tuberculin test which have been injected with tuberculin within 60 days immediately preceding or which have at any time reacted to a tuberculin test.

4. No herd shall be classed as an accedited herd in which tuberculosis has been found by the application of the test, as referred to in paragraph 1, until such herd has been successfully subjected to two consecutive tests with tuberculin, applied at intervals of not less than six months, the first interval dating from the time of removal of the tuberculous animal from the herd.

5. Prior to each tuberculin test satisfactory evidence of the identity of the registered animals shall be presented to the inspector. Any grade cattle maintained in the herd, or associated with animals of the herd, shall be identified by a tag or other marking satisfactory to the State and Federal officials.

6. All removals of registered cattle from the herd, either by sale, death, or slaughter, shall be reported promptly to the said State or Federal officials, giving the identification of the animal and, if sold, the name and address of the person to whom transferred. If the transfer is made from the accredited herd to another accredited herd, the shipment shall be made only in properly cleaned and disinfected cars. No cattle shall be allowed

to associate with the herd which have not passed a tuberculin test approved by the State and Federal officials.

7. All milk and other dairy products fed to calves shall be that produced by an accredited herd, or, if from outside or unknown sources, it shall be pasteurized by heating to not less than 150° F. for not less than 20 minutes.

8. All reasonable sanitary measures and other recommendations by the State and Federal authorities for the control of tuberculosis shall be complied with.

9. Cattle from an accredited herd may be shipped interstate, by certificate obtained from the office of the State live-stock sanitary officials of the State in which the herd is located or from the office of the Bureau of Animal Industry, without further tuberculin test for a period of one year, subject to the rules and regulations of the State of destination.

10. Strict compliance with these methods and rules shall entitle the owners of tuberculosis herds to a certificate, "Tuberculosis-Free Accredited Herd," to be issued by the Bureau of Animal Industry and the State live-stock sanitary authority. Said certificate shall be good for one year from date of test unless revoked at an earlier date.

11. Failure on the part of owners to comply with the letter or spirit of these methods and rules shall be considered sufficient cause for immediate cancellation of cooperation with them by the State and Federal officials.

CANADIAN REGULATIONS

Dominion of Canada—Department of Agriculture—Health of Animals Branch. Regulations for the Establishment and Maintenance of Tuberculosis-Free Accredited Herds of Cattle

1. A tuberculosis-free accredited purebred herd is one which has been tuberculin tested by the subcutaneous method, or any other test approved by the Veterinary Director General, and applied by the regularly employed veterinary inspectors of the Health of Animals Branch of the Federal Department of Agriculture. Further, it shall be a herd in which no animal affected with tuberculosis has been found upon two annual or three semi-annual tuberculin tests, as above described, and by physical examination.

2. The entire herd, or any cattle in the herd, shall be tuberculin tested or retested at such time as is considered necessary by the Veterinary Director General.

3. No cattle shall be presented to the tuberculin test which have been injected with tuberculin within 60 days immediately preceding or which have at any time reacted to a tuberculin test.

4. No herd shall be classed as an accredited herd in which tuberculosis has been found by the application of the test, as referred to in paragraph 1, until such herd has been successfully subjected to two consecutive tests with tuberculin, applied at intervals of not less than six months, the first interval dating from the time of removal of the tuberculous animals from the herd.

5. Prior to each tuberculin test satisfactory evidence of the identity of the registered animal shall be presented to the inspector. Any grade cattle maintained in the herd, or associated with animals of the herd, shall be identified by a tag or other markings satisfactory to the Veterinary Director General.

6. All removals of registered cattle from the herd, either by sale, death or slaughter, shall be reported promptly to the said Veterinary Director General, giving the identification of the animals, and, if sold, the name and address of the person to whom transferred. If the transfer is made from the accredited herd to another accredited herd, the shipment shall be made only in properly cleaned and disinfected cars. No cattle shall be allowed to associate with the herd which have not passed a tuberculin test approved by the Veterinary Director General.

7. All milk and other dairy products fed to calves shall be that produced by an accredited herd, or, if from outside or unknown sources, it shall be pasteurized by heating to not less than 150° F. for not less than 20 minutes.

8. All reasonable sanitary measures and other recommendations by the Federal authorities for the control of tuberculosis shall be complied with.

9. Cattle from an accredited herd may be shipped to the United States accompanied by the certificate of the Veterinary Director General, without further tuberculin test for a period of one year, subject to the rules and regulations of the State of destination.

10. Strict compliance with these methods and rules shall entitle the owner of tuberculosis-free herds to a certificate, "Tuberculosis-Free Accredited Herd," to be issued by the Veterinary Director General. Said certificate shall be good for one year from date of test unless revoked at an earlier date.

11. Failure on the part of owners to comply with the letter or spirit of these methods and rules shall be considered sufficient cause for immediate cancellation of cooperation with them by the Federal officials.

12. Whenever in carrying out this order it is necessary to slaughter an animal or animals for the eradication of tuberculosis from a herd, the animal or animals shall be valued and compensation awarded as provided in Sections 6 and 7 of the Animal Contagious Diseases Act.

Persons desiring to enroll their herds under these regulations should apply to the Veterinary Director General, Ottawa, who will forward the official forms.

F. TORRANCE,
Veterinary Director General, Ottawa.

COMMUNICATIONS FROM MEMBERS OF THE COMMITTEE

BERKELEY, Cal., *November* 13, 1919.

To the Members of the A. V. M. A., New Orleans, La.—GENTLEMEN:

For one reason or another, your Committee on Bovine Tuberculosis has not met this year. The past year has no doubt been the most active in the history of the control of bovine tuberculosis and it therefore seems desirable that you should obtain some expression regarding this important subject from your committee.

The report submitted to this Association in September, 1910, by your commission was so comprehensive and free from erroneous statements and unwise recommendations that it has stood the test for the past nine years, and it seems to me that your present committee could do no better than to bring to your notice the developments that have been brought forward since the date of the above-mentioned report.

The two most important developments in the control of bovine tuberculosis are:

(1) The plan of accrediting tuberculous-free herds, and

(2) The attention that the methods, other than the subcutaneous tuberculin test, have received in the diagnosis of tuberculosis. Even these two phases of tuberculosis control did not entirely escape the notice of your first commission, for in 1912 that commission saw the wisdom of registering dairy herds known to be free from tuberculosis and asked, by letters, the Governments of the United States and Canada to take definite action in this matter. In their reports of 1913, 1915 and 1916 the commission mentioned other forms of tuberculin testing but did not think it advisable to adopt methods other than the subcutaneous test on the knowledge at hand at the time of their reports.

The certifying and accrediting of tuberculosis-free cattle by the United States Department of Agriculture, Bureau of Animal Industry, in cooperation with the various State live-stock agencies, should be highly commended. This is one of the most extensive moves ever undertaken in the

control of bovine tuberculosis, and the greatest feature of the plan is that it is entirely voluntary—no law to force cattle owners into this cooperative plan.

This plan will develop many tuberculous-free herds. It will also no doubt be attended by some setbacks, by uncontrollable, undesirable and unlooked-for results, but careful observation and interpretation of its failures will be a means of bringing to light new thoughts or more probably emphasize some already-known facts that have hitherto not received proper recognition. This was very evident to everybody present at the conference on tuberculosis held in Chicago October 6 to 8, inclusive. I now have in mind the open and free discussion on the various forms of tuberculin testing. This, however, leads up to the other important development since the last report and will be discussed presently.

In connection with the establishment of accredited tuberculous-free herds there appears to me to be a grave question as to the advisability of indiscriminately slaughtering animals that react to the tuberculin test. This procedure is now being practiced in establishing accredited herds. The bearng that reacting animals have upon the milk supply, the dairy industry and the development of the breeds in the community or the country at large should be carefully considered in determining the disposition of reacting animals. The establishment of individual or community tuberculous herds should receive due consideration.

We can no longer fail to recognize the place that forms other than the subcutaneous tuberculin testing have in the control of bovine tuberculosis. What the future will produce can not be absolutely foretold, but the evidence at present at hand makes it very plain that the intradermal tuberculin test is at least as accurate as the subcutaneous; that the ophthalmic test can replace neither of the above, but, in combination with them, it makes tuberculin testing more accurate; in fact, it has been demonstrated beyond dispute that a combination of tests should be made wherever possible, since no form of tuberculin testing detects all cases of tuberculosis, and since a tuberculous animal, while giving negative results to one form, may be positive with another form of tuberculin testing.

The intradermal injection of tuberculin gives rise to a thermal reaction when used in suitable doses. The practical application of this observation is very evident; that is, by one injection, one can make use of two diagnostic manifestations of tuberculin application, namely, (1) general reaction as indicated by a rise in temperature and (2) a local reaction. The San Francisco County Medical Milk Commission has taken advantage of this observation and has recently adopted this method for testing for additions to herds producing certified milk. The subcutaneous test was formerly used.

The physical examination for the detection of tuberculosis in cattle when used in conjunction with bacteriologic examination and tuberculin testing will no doubt add another safeguard in making cattle environs free from tuberculous cattle, and, in the final analysis, the control of bovine tuberculosis resolves itself into providing for the uninfected cattle environments which are free from tuberculous animals and from materials made infected by such animals.

To be able to make a proper physical examination is an attainment which every practicing veterinarian should strive to develop. To use it as above mentioned is highly recommended whenever practicable, but to depend upon it to the exclusion of other methods of diagnosis will lead to worse grief than does the use of tuberculin testing alone.

The activities of the various bodies interested in the control of bovine tuberculosis now under way will no doubt bring forth new facts and new thoughts, and it appears to me that your committee can serve no better purpose than to bring before you every year such new developments and suggest recommendations concerning them.

Respectfully submitted, J. TRAUM.

CHICAGO, *November* 15, 1919.

DR. JOHN G. WILLS,
Committee on Bovine Tuberculosis,
American Veterinary Association,
New Orleans, La.

DEAR DOCTOR: We are living in an age of rapid radical changes which we believe will ultimately result in greater good for all the people. Theories of five years ago are facts today, and no man can safely say how many more time-honored usages may within the next five years go in the discard. In line with this idea of evolution and progress, I believe this occasion is timely to present a suggestion on tuberculosis control which, while it may appear revolutionary, is in fact merely in line with the best governmental practice demonstrated absolutely necessary, workable and advantageous during the war period.

The location of reactors is a comparatively simple matter. The disposition of reactors on a fair and equitable basis is the crux of the whole problem.

Owners of reactors who have acted in good faith in maintaining animals which in fact are a menace to the health of the people can hardly be expected to cheerfully consign such animals to slaughter with the prospect of carrying practically the entire burden of financial loss. I wish to suggest to this committee a plan by which the burden would be placed upon the public, to wit, the consumers of live-stock products.

Under this plan a Federal law would require a stamp tax imposed on every pound of meat, butter and cheese and every quart of milk or cream entering commercial distribution. This tax would be of such size as to provide a fund, of which the U. S. Department of Agriculture would be the custodian and distributor, from which would be paid the cost of all cattle condemned and slaughtered on account of tuberculosis, with, of course, proper credits for such hide, carcass and offal returns which would be possible under a careful system of handling.

To direct this work and properly administer this fund a commission or bureau would be provided by act of Congress with its sole concern the eradication of bovine tuberculosis in all classes of meat animals and poultry. The act would provide penalties for violation of the law and regulations.

I believe now is the time to begin work on this plan, as probably a considerable period would be involved in carrying it to the point of practical operation. Careful consideration by your committee is respectfully recommended.

Yours very truly, J. J. FERGUSON.

THE PRESIDENT: There is one announcement that I wish to make. I am afraid it is required by the Constitution and By-Laws that the President appoint men to fill vacancies when they occur on committees and especially the Executive Board. Dr. Archibald is unable to be with us on account of illness, and he requested that one of two men from California should represent him on the Board. I do not think that either of those men are here. It is important that that district should be represented, and consequently I wish to announce the appointment of R. P. Marstellar to act as the substitute of Dr. Archibald during this session.

I wish also to call attention to a matter that I should have mentioned earlier, and that is, a letter that I received from Prof. Vallée in acknowledgment of the receipt of the money that was sent to the veterinarians of France and Belgium through this Association. The letter was exceedingly appreciative of the efforts and work of this

Association. I think that we should understand that Prof. Vallée and his colleagues on the other side are fully grateful for what we have done, which certainly was not very great.

The report of this Committee on Tuberculosis is before you for discussion. Are there any remarks?

DR. W. H. HOSKINS: In regard to the two men referred to as having some knowledge as to the means of propagation of tuberculosis, 10 or 15 years ago Dr. F. E. Weber was investigating tuberculosis in rats just outside of Lancaster. He found nearly 8 per cent of the rats affected with tuberculosis. His observations went further and he observed that those rats went all around that neighborhood, in the field, and would go out in the grass and have coughing fits and throw that material out of their lungs onto the grass, and observed in many instances great numbers of cattle that grazed there, consuming that grass. Later, plans were made to destroy those animals. Later on, in an endeavor to demonstrate the conditions where there was no proper meat inspection, they hired a store and exhibited some of the meat that was being killed there, bought from such sources, but local and other authorities thought the thing was dangerous for the public and suppressed the efforts of Dr. Weber.

THE PRESIDENT: Are there any other remarks, any further discussion? This matter comes under the head of Committee Reports.

DR. MUNCE: In view of the fact that the chairman of that committee suggested that the Association consider the advisability of continuing or discontinuing the committee, I move that the report be referred to the Executive Board.

(The motion was seconded and carried.)

THE PRESIDENT: Under the heading of Committee Reports would come the reports of the Resident State Secretaries. I should like to know if there are any who care to present their reports.

I wish to say on behalf of the State Secretaries that I believe they have been exceedingly active this year. They have done splendid work and they should have full recognition, and I do not doubt but what they have some very valuable reports. It would take some time to call on all of these. Are there any who have not submitted their reports, who would like to present them at this time? Dr. Hollingworth, would you like to present your report?

(Dr. Hollingworth responded negatively.)

THE PRESIDENT: If there are none and if there is no opposition they will be read by title and printed in the proceedings.

That concludes the work for this session unless some of the chairmen of the committees have come in since we went over the list. If there is any chairman of a committee who was absent when his committee was called, will he please come forward? If not, the meeting will stand adjourned until tomorrow, and I wish to call attention to the importance of prompt attendance at these section meetings tomorrow morning. The secretaries and chairmen of the sections have provided most valuable and instructive programs and we hope that you will each be in the section of your choice and that

you will see that all of the members who are in attendance are also present.

Has any one any further business to come before the meeting?

DR. EICHHORN: The extract of the letter which you conveyed to the members of the Association by Prof. Vallée, I think should be responded to, and I make a motion to the effect that a cablegram be sent to Prof. Vallée, expressing our willingness to continue the support of the leading members of the profession in the stricken countries.

(The motion was seconded and carried.)

THE PRESIDENT: Whom do you wish to formulate that cablegram? Do you wish to have a committee appointed?

DR. EICHHORN: It is up to the President.

THE PRESIDENT: I will appoint Dr. Eichhorn, Dr. Mohler and Dr. Dalrymple.

Adjournment.

(*Proceedings to be continued.*)

OTHER MEETINGS

ALUMNI OF NEW YORK UNIVERSITY

THE Veterinary College Alumni of New York University, which includes the graduates of New York College of Veterinary Surgeons and the American Veterinary College, after 40 years of a separate existence has combined with the alumni of the other eight schools and colleges in the General Alumni Association of New York University. The purpose of the amalgamation is to bring the united power of the alumni to bear upon the problems of all the schools and to establish a close relationship between the graduates and undergraduates. It is contemplated providing a fund of $100,000 for the Veterinary College, whose chief interest is medicine as applied to animals and the interrelations of animal diseases and the health of the community.

The officers of the Veterinary Association are: Dr. George H. Berns, '79, President; Dr. William H. Kelly, '89, Vice-President; Dr. Adolph Eichhorn, '00, Secretary; and Dr. David W. Cochran, '80, Treasurer. The Executive Committee are Dr. L. H. Howard, '82, Boston; Dr. Robert W. Ellis, '89, New York; Dr. M. W. Drake, '90, Philadelphia; Dr. Thomas E. Smith, '97, Jersey City, N. J.; and Dr. W. C. Miller, '04, New York. Dr. William H. Lowe, representing the Veterinary College, is a director of the General Alumni Association. Mr. Howard F. Langland, '14, has been appointed Secretary of the General Alumni Association with offices at 512 Fifth Avenue, New York City.

CONFERENCE OF MARYLAND VETERINARIANS

THE first of a series of meetings of the veterinarians doing control and eradication work in the State of Maryland was held at the office of the State Board of Agriculture, Baltimore, on January 8, 1920. Dr. R. C. Reed, Chief of the Live Stock Sanitary Section of the Board, at whose instigation the meeting was called, presided. In his opening remarks he stated that the object of the meeting was to get together the Federal, State and practicing veterinarians for the purpose of an exchange of views on the methods and plans for the continuation of the regulatory and field work within the State.

The morning session was devoted to a symposium on bovine tuberculosis with special reference to the control and eradication of the disease by the accredited-herd plan. Dr. J. A. Kiernan of the Federal Bureau of Animal Industry was the chief speaker. He gave a very encouraging account of the progress of this work throughout the country. The keynote of his speech was the necessity of hearty cooperation between the live-stock owners, the veterinarians and the State and Federal authorities. After Dr. Kiernan's address the subject was discussed by several prominent veterinarians among whom were Drs. Lash, Ladson, Smith, Mackie, Gilfillan and several others. Dr. Pickens of the Maryland Live Stock Sanitary Laboratory made the statement that the laboratory was well equipped to handle the diagnosis of the infectious diseases and would be glad to aid the field men in every way possible.

The afternoon session was devoted almost entirely to hog cholera and its control. Dr. U. G. Houck of the Federal Bureau of Animal Industry gave the principal address. Among many other interesting things he stated that the Federal Government in cooperation with the States hopes to be able soon to start a national campaign to eradicate hog cholera from this country. He also emphasized the importance of careful technic in the administration of immunizing agents to hogs. The discussion was continued by Drs. Atherton, Melody, Cole and others.

Those present were Drs. Houck, Kiernan, Lash, Ladson, Arnold, Ernest, Benner, Simonds, Atherton, Cole, McLaughlin and Cass, of the Bureau of Animal Industry; Drs. Reed, Hoffman, Grapp, Sill, Pickens, Shivers, and Welsh of the State force, and the following practitioners: Drs. Koerner, Sapp, Corrigan, R. H. Smith, R. V. Smith, Melody, Zinkham, McClellan, Lambert, Gilfillan, Rome, Grubb, Mackie, Horner, Young and Ryan.

E. M. PICKENS.

NECROLOGY

DR. HARRY E. STATES died at Detroit, Mich., Monday afternoon, December 8, 1919, in his forty-ninth year. Death was due to heart disease following a complication of other diseases from which he had been a sufferer for more than a year. About a month before his death he went to the Mayo Clinic at Rochester, Minn., to see whether any treatment other than that already prescribed for him by his own physician would give him any relief. He had returned to Detroit and was looking after his official duties up to the end.

Dr. States was born at Laceyville, Pa., April 6, 1871. He entered the University of Pennsylvania in the fall of 1900 and received his degree in 1903. About that time Frederick Stearns & Co. of Detroit were entering the biological manufacturing field and wanted a veterinarian to take charge of their serum-producing horses. When they wrote to the late Dr. Leonard Pearson, then Dean of the University of Pennsylvania Veterinary Department, he selected Dr. States for the position, which the latter held for about four years.

In 1907 Dr. States accepted a position as veterinarian to the Detroit City Board of Health, and at the time of his death he was one of the oldest employees of the Board of Health in years of continuous service. He had charge of the meat inspection in Detroit, as well as the inspection of the herds supplying certified milk to that city under the direction of the Medical Milk Commission. Dr. States personally supervised the tuberculin testing of these herds, and was exceptionally accurate, painstaking and conscientious in this work. During the late war he had the additional duties of director of the dairy and food department of the Detroit Board of Health when the position was made vacant by Mr. C. H. Chilson entering military service.

Dr. States was an enthusiastic association worker. At the time of his death he was President of the Southeastern Michigan Veterinary Medical Association and also of the Michigan Milk and Dairy Inspectors' Association, in both of which organizations he was a moving spirit. He was a member of the American Veterinary Medical Association, the Michigan State Veterinary Medical Association, the Michigan-Ohio Veterinary Medical Association, the United States Live Stock Sanitary Association and the International Association of Dairy and Milk Inspectors. He was a member of Ionic Lodge No. 474, F. and A. M.

The funeral took place Saturday afternoon, December 13, under Masonic auspices. The services were attended by many members of the profession from Detroit and vicinity. Many beautiful floral offerings were sent in the names of the associations in which the deceased had taken such an active part.

Dr. J. M. Urba of Oklahoma City, Okla., died December 10, 1919. Dr. Urba was a graduate of the McKillip Veterinary College in 1908 and was admitted to membership in the American Veterinary Medical Association in 1917.

MISCELLANEOUS

A TRIP TO THE PACIFIC COAST

IN response to an invitation from the California State Veterinary Association to come to the "Golden State" and assist in holding a short course for the veterinarians of the State, the writer, accompanied by Mrs. Mayo, left Chicago December 21 for the coast. We went out over the Santa Fe partly because there is less snow along the line and partly because it crosses Kansas, our old stamping ground, where 30 years ago we sought out glandered horses and chased the gay and festive cattle tick and mange mite. Once in those long-past days I was rather skeptical as to whether the tick was the real cause of Texas fever, so skeptical in fact that I put some young ticks, hatched from eggs sent me through the mail by Dr. Francis of Texas, upon a Jersey cow I owned. It is unnecessary to add that when I hauled out the cow for "the last sad rites" I had become a convert to the "tick theory." We passed near the old Fort Larned ranch in Southwestern Kansas where I first reported cattle scabies in the United States, so the trip revived many pleasant memories of days of long ago.

Several inches of snow covered the ground when we left Chicago, but in Kansas this had disappeared, although we could see snow in the mountains of New Mexico, Arizona and California. It was a delightful surprise, after crossing the Mojave desert and the Sierra Madre mountains, to literally drop down into the beautiful orange groves of San Bernardino.

We went on at once to San Francisco, reaching there Christmas morning. We spent several very pleasant days in and about San Francisco. Dr. O. J. Kron, who has a fine small-animal hospital and a large practice, gave us a delightful automobile ride, showing

us all over the city. Dr. and Mrs. Haring also entertained us royally. While in San Francisco I called on Dr. R. A. Archibald, ex-President of the A. V. M. A. and member of the Executive Board. Dr. Archibald has been in poor health and confined to his bed for a year, but was showing some improvement at the time of my visit. While he was not able to attend the A. V. M. A. meeting at New Orleans, he takes an unusual interest in the work of the Association, and I was able to give him an account of the interesting meeting in New Orleans. He inquired about his many friends. I hope that all who can will write to Dr. Archibald, for I am sure he would appreciate this very much.

On December 29, under the guidance of Dr. Haring and with a group of veterinarians, we went to the University Farm at Davis, Calif., where the short course was held. At Davis we met Dr. W. J. Lentz of the University of Pennsylvania, who had also come to help with the short course.

I shall not attempt to report the excellent meeting, as someone else promised to do this for THE JOURNAL. Everything went off promptly, and an active interest was taken in the meeting by the 70 veterinarians who attended and stayed the full three days.

While I enjoyed the meeting very much, I am not boosting the climate of Davis. It's wonderful how near one can come to freezing with the thermometer above the freezing point. A dense fog enveloped everything three days we were there, so we did not see the sun. We were assured, however, that the weather was very unusual.

On New Year's Eve we left for Los Angeles, where we were to meet with the southern branch of the California Veterinary Association. When we got off the train at Los Angeles New Year's morning we were met by Dr. and Mrs. Bushong, who took us in their motor directly to Dr. Boucher's residence in Pasadena. Dr. Boucher was assistant marshal of the great Carnival of Roses that was to take place at once, so we did not see him until he rode past in the procession. We all voted him the handsomest man in the parade. As soon as the parade was over we returned to Dr. Boucher's home, where his charming wife kept "open house" and served us a fine lunch, and then away to the park to see the football game between Harvard and the University of Oregon. The "beaneaters" won, 7 to 6, but it surely was "some game."

New Year's night the Southern California branch of the association gathered for an excellent dinner at the Hotel Green, and

a veterinary meeting was also held. The next morning Dr. Boucher took us for a fine ride about the city of Pasadena, showing us the famous Busch Gardens and the interesting old Mission of San Gabriel. In the afternoon a clinic was held at the fine small-animal hospital of Dr. Agnew, at which Dr. Lentz operated and lectured. About 40 veterinarians were present. In the evening another dinner and meeting were held at Hotel Green.

We do not want to indulge in any flattery, but the California veterinarians are a "live bunch," up to date and anxious to keep in the front line of progress. They are royal entertainers and gave us a delightful time, and to them we wish to express our gratitude.

After a few days in the delightful sunshine and among the flowers and orange groves of Southern California we left for Chicago, stopping en route to visit the magnificent Grand Canyon, then back to the cold of Chicago. After all, about the best part of such a delightful three weeks' trip is getting back to the place one calls home.

N. S. MAYO.

A PATRIOTIC VETERINARY FAMILY

THE JOURNAL is pleased to present to its readers a picture of Dr. Frederick William Grenfell, of Washington, D. C., and his three fine-looking sons, all of whom were "across" and all of them severely wounded. Seldom has a family in this world's war suffered a 100 per cent casualty of those engaged.

Dr. Grenfell is the oldest graduate veterinarian practicing in Washington, coming to this city directly after his graduation at the Royal Veterinary College, England, in 1888. He has been a leading practitioner of this city since that date, and at present is Secretary-Treasurer of the District Veterinary Examining Board. The Doctor is the proud father of four sons, the youngest not being eligible for military service on account of his youth.

1st Lt. Frederick A. Grenfell, V. C., on crutches, was the most severely wounded veterinary officer in the A. E. F. He was commissioned June 20, 1917, called to active service July 2, 1917, promoted First Lieutenant March 19, 1918, and went overseas with the 33d Division as Brigade Veterinarian, 65th Infantry Brigade. He was assigned to 18th Field Artillery, June 28, 1917, and was in the second Battle of the Marne and the Aisne-Marne offensive with the 121st Field Artillery. On September 24, 1918, he was assigned to 128th Field Artillery and was wounded October 1 at 1 a. m. at

DR. FREDERICK WILLIAM GRENFELL AND SONS

Charpentry (Argonne) by a high explosive shell, sustaining a compound, comminuted multiple fracture of left tibia and fibula, and deeply burned by mustard gas while lying on the battle field.

Lieut. Grenfell was evacuated to base hospitals at Dijon, Poitiers and Bordeaux, France, and later to Walter Reed General Hospital, Washington, D. C., on February 23, 1919, where he has undergone several very painful operations and is at present under treatment at this hospital. He is a graduate of the College of Veterinary Medicine, George Washington University, and was in the Virus-Serum work of the Bureau of Animal Industry when commissioned.

Wm. Joseph Grenfell, sitting on the edge of his father's chair, was a Corporal in the Signal Corps and was transferred successively to the 30th Engineer Gas and Flame Pioneer Regiment and then to the 38th Engineers, where he was promoted Sergeant. He was knocked off a 65-foot pole August 18, 1918, sustaining a fracture of the second cervical vertebra. He was evacuated to the United States June, 1919, and discharged August 25, 1919, at Walter Reed General Hospital, Washington, D. C.

Carrol Joseph Grenfell, standing in rear of his father, enlisted in the Navy, June 5, 1917, and was discharged on account of physical disability January 17, 1918. He enlisted in the Medical Corps, U. S. Army, April 3, 1918, and went overseas June 24, 1918, with the 145th Infantry. He saw active service in the Argonne offensive and in Belgium. A piece of high explosive shell went through his right thigh, his "bunkie" being killed by the same shell. He was evacuated to the United States and discharged June 29, 1919, at the Walter Reed General Hospital, Washington, D. C.

Dr. and Mrs. Grenfell should be proud of their three fine sons, and the JOURNAL wishes to congratulate these young heroes on their splendid military records.

EXECUTIVE BOARD NOMINEES

As a result of the postal-card vote for nominees for the Executive Board vacancy for the Fourth District, the following selections were made (arranged alphabetically): Houck, Kiernan, Kinsey, McInnes, Musselman, Turner, a tie vote requiring a sixth name. These names are now being presented for a final selection to be announced March 1. May the best man win.